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JUNE, 1937

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The Mining Congress Journal

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Vol. 23

JUNE, 1937

Number 6

CONTENTS

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EDITORIALS:

	Page
The Right to Bargain	14
The White House Program	15
Iron Collars	15
Pay to the Order of	15
Industry's Profits	15
The Importance of Research	16
Future of Mechanization	16
The Six-Hour Day	16
A Skilled Labor Shortage	16
A Remarkable Demonstration	16

THE FEDERAL SECURITIES ACT AND ITS EFFECT ON THE MINING INDUSTRY	17
--	----

By Harry S. Silverstein

CUTTING REQUIREMENTS FOR CONVEYOR MINING	24
--	----

By J. O. Cree

LOWERING COSTS BY "RUBBER TIRED" MINING	26
---	----

By J. H. Fletcher

SAFE USE OF ELECTRICITY IN OPEN PIT MINING	27
--	----

By A. C. Butterworth

CANADA'S LARGEST ELECTRIC HOIST	30
---------------------------------	----

By Alex J. Nicht, Jr.

AN EPOCHAL EVENT	32
------------------	----

WHEELS OF GOVERNMENT	20
----------------------	----

OF ALL THINGS	23
---------------	----

MECHANIZATION TRENDS	47
----------------------	----

NEWS AND VIEWS	49
----------------	----

PERSONALS	55
-----------	----

WITH THE MANUFACTURER	56
-----------------------	----

Published monthly. Yearly subscription, United States and Canada, \$3.00. Foreign, \$4.00. Single copies, \$0.30. Entered as Second Class Mail Matter, January 30, 1915, at the Post Office at Washington, D. C.

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THE AMERICAN MINING CONGRESS

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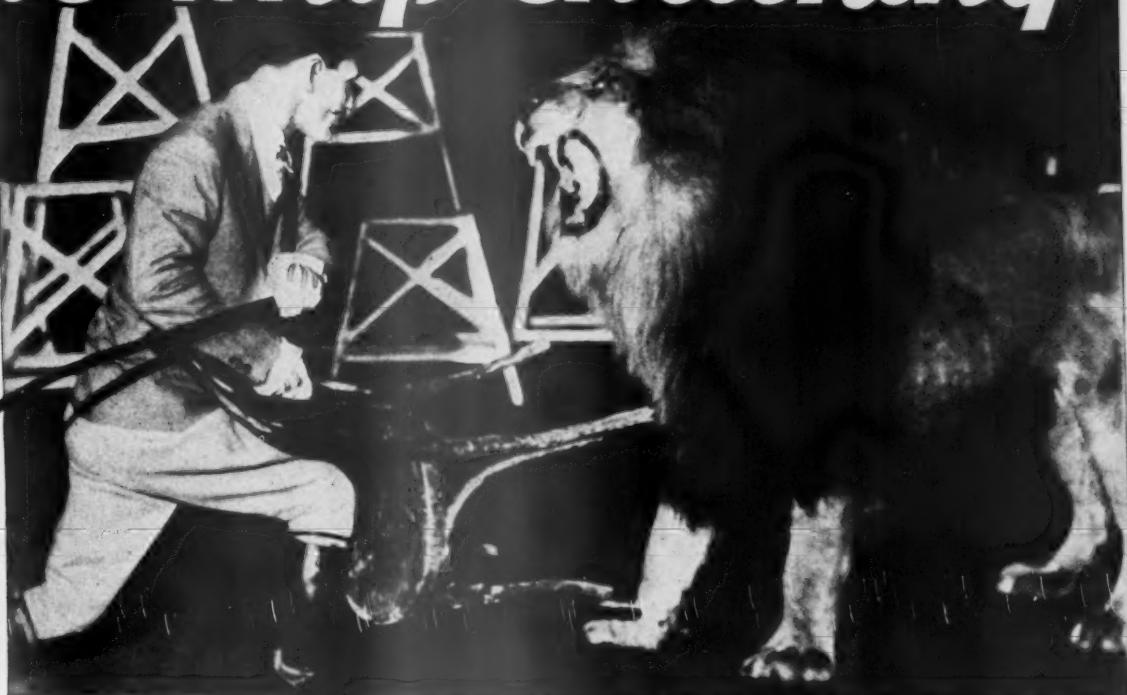
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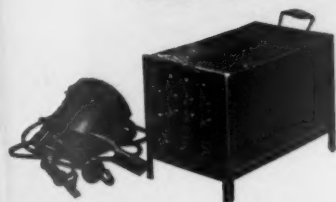
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● **Reduced Time Losses**—Fast tramping, quick and easy operation, "Lined-up Discharge" and "One Lever Control" are factors that enable the "260" to spend a greater portion of its working time filling up the empties. Its excellent design and strong construction keep this machine loading under the most severe operating conditions.

● **High Production**—The powerful gathering head, swift conveyors and the speed and ease of maneuvering contribute to the fast loading ability of the "260". This track type loading machine has conclusively demonstrated its high production at numerous installations, and the many satisfied owners are conclusive proof of its effectiveness.

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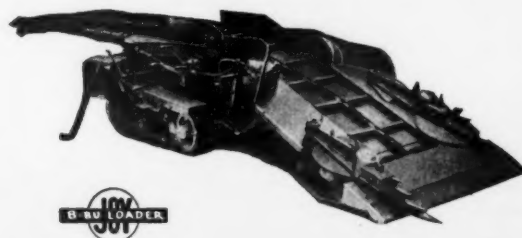
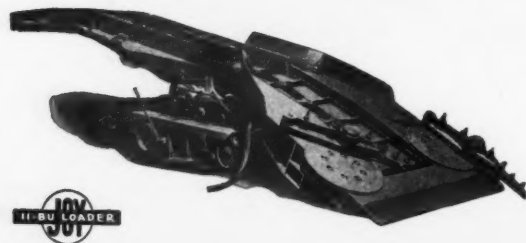
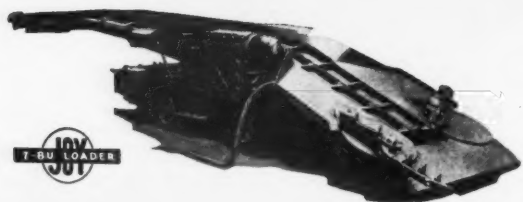
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accidents and delays where treated material is used.

Shown in the accompanying photographs are details of a treated timbering job in the main air course of a mid-West mine (left), and a main haulage track section of a neighboring mine (right). The 6x8—6' Creosoted oak ties in this track were laid in 1923, and have carried more than 3,000,000 tons of coal without requiring replacements.

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Koppers Tarmac Cuts Maintenance Cost of Private Streets and Roads—The long life and skid-resistant qualities of Tarmac combine with a low first cost to make it highly desirable as paving material for private roads, streets and parking areas. Photo shows Tarmac on private street in a West Virginia mining town.

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scale oven tests of
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Another Koppers-Rheolaveur Plant Recently Put Into Operation—Pictured here is the new plant installed at Island Creek Coal Co. Mine No. 7, near Holden, W. Va. This plant is equipped to wet-clean 360 t.p.h. of coal in sizes from 5" to 1/4", and to dry-clean 67 t.p.h. of 1/4" to 0".

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The Right To Bargain

IT IS strange to note that organized labor, after years of effort to secure and insure the right of collective bargaining, is now favoring legislation which will interfere with the right of bargaining.

The Black-Connery Bill (S. 2475-H. R. 7200) provides for the fixing of standard wages in all lines of business engaged in "the production of goods for interstate commerce or otherwise directly affecting interstate commerce."

This bill undertakes to standardize labor conditions and apparently destroys any opportunity which an intelligent workman may have to better his conditions above the level of mediocrity which may prevail. Under that plan Wm. S. Knudsen, president of General Motors, would probably still be a workman in the shop drawing the same maximum wage as the most ignorant and inefficient of his fellow workmen.

Under the provisions of this bill, no line of production, of any article not consumed on the premises, can escape practical annihilation if an order of the labor board to workers in that industry shall so decree. The power of life or death over any industry; the control of what you eat or what you produce in order that you may have something to eat, is but one of the many un-American features of this proposed legislation.

We have, on one side, the wealth of the country being divided by extravagant and wasteful expenditures to be paid from tax receipts, thus, as rapidly as possible, destroying the power of industry to employ labor. Upon the other side we have an effort to make unlawful any act by the employer not in accordance with the (back-stage directed) whim of a controlled labor board.

"Whenever the board shall have reason to believe . . . the board shall make an order establishing the minimum fair wage for employes in that occupation."

What is to become of collective bargaining? What of bargaining of any kind?

Step by step we are moving toward a Fascist control of the many, by the few, and the few by a dictator. Step by step we are surrendering personal individualism, local self government, state control over affairs of purely state concern and the kind of constitutional government under which we grew to be the greatest nation on earth.

We should be thankful that there are still men in public life, who, like Senator Byrd of Virginia, are intelligent and courageous; who refuse to prostitute their independence to the selfishness of local communities who seek local improvements from the Federal treasury and soothe their conscience by the excuse that the time to get, is when the getting is good.

Let us be thankful for the returning independence of those congressmen who begin to recognize their oaths of office to support a constitutional government and the checks and balance which are necessary to the preservation of democracy.

Let us hope that enough legislative support can be mustered to check the ever widening demand of a small minority not only to control our government now, but to secure the passage of laws which will make that control permanent.

Let us hope that the right to bargain either individually or collectively; the right to sell our labor or the product of our labor, limited only by the law of supply and demand, will not be abolished.



The Mining Congress Journal



Vol. 23

JUNE, 1937

Number 6

E. R. COOMBES, Editor

A Journal for the entire mining industry published by The American Mining Congress

The White House Program

RECENT EVENTS HAVE cleared the Washington atmosphere. The lull in Congressional activity, which so far has produced only one major piece of legislation—the Bituminous Coal Control Act—apparently is over. Adjournment of Congress is now anticipated for early August, with the White House Program including Government Reorganization, Wage and Hour Legislation, National Planning. Commentators generally believe that the Supreme Court “Packing” proposal is a dead issue, and that there will be no new taxes at this session.

Government reorganization will be highly controversial; the wage and hour legislation, which is a revival of some of the principles of the late unlamented NIRA, will meet stubborn opposition; and National Planning involving the Government’s Power program isn’t exactly an harmonious subject.

All in all it looks like a interesting wind-up of an otherwise more or less dull session. For those who like fireworks there will be plenty of action, with never a dull moment on the banks of the Potomac.

Iron Collars

SEVERAL YEARS AGO, Samuel Gompers made a spectacular campaign to the end that labor should not be regarded as a commodity. Today, labor has a new campaign; the placing of every working man in a union. And it has enlisted the Government’s aid to accomplish the desired result.

There is no gainsaying that in the past labor has had cause for complaint, but a review of its history will show that its troubles have been balanced by its blessings. Much has been said about labor wearing “capital’s iron collar”; but what about the present proposal to add another collar? Today, labor is sticking its neck into the less elastic collar of unionization. Will the answer be more pleasant? We doubt it. In all history the ascendancy of power in the hands of labor leaders has brought a ruthlessness in the dealing with labor. Will labor like orders from union officials better than orders from the industry that pays its wages? For there inevitably must be “orders.” The point at issue is who gives them. Labor’s new boss is not the boss who pays him wages, but the bosses who makes him pay them.

Pay to the Order of.....

HOW MANY OF US—capitalists or laymen—would issue vast sums of money to be spent “at the discretion” of another with no control of the outgo? Few, we wager. Yet we, as a nation, have, in the period from 1933 to 1937, placed at the disposal of the Administration the staggering sum of 15-billion, 428 million dollars to be spent at the discretion of the executive. Figures recently compiled by the *United States News* show that for the period from 1789 to 1933, Congress gave 30 Administrations 1-billion, 687 million dollars to be spent at their discretion. This sum included such periods as the Civil War and the World War.

Where do we stop? When will the people realize that the Government can spend only as it taxes? When will they demand an accounting from their representatives? Is it reasonable to admit that our problems of today—granting our growth—are nine times as great as all of those that have confronted us within a period of 143 years?

There are many reasons for citizens of this country to stop-look-listen, and not the least is our indisputable record of stupendous spending; spending that can only be recovered by taking from those who now authorize the orgy.

Industry’s Profits

WITH SO MUCH discussion upon the always interesting topic, Re-distribution of Wealth, there is certain to be considerable attention to industry’s profits. Certainly much careless language is going the rounds upon this subject. If we can rely upon statistics there is much evidence to the effect that industry as a whole hasn’t been so profitable.

W. J. Cameron of the Ford Motor Company has recently presented another side of the subject. He points out that “for every dollar earned by industry, the dollar must first be spent.” The great Ford Company started life with very little capital, one shop and 75 men. Today, the capital structure has grown, but so has the plant’s ability to employ increased. In 30 years the employed in that plant has increased from 75 to 125,000. He gives data to substantiate the fact that during the period of expansion, the company has earned approximately 4 percent upon its investment . . . probably less.

Industry's profits cease to become profits when they become static. And when spent they go back directly into the pockets of the citizens of the country. When a company determines to expend a million dollars for plant expansion, what happens? Contracts for materials and supplies are awarded, which in turn go directly into increased employment and wages.

It is time to debunk the theory that profits are inexcusable. Without profits the United States today would not be a world power. The mistakes of industry are off-set many times by the examples of wise utilization of our profit system.

The Importance of Research

RESEARCH IS RAPIDLY taking its rightful place in meeting industry's problems. A pertinent statement recently by the President of Bituminous Coal Research, Inc., should not pass unobserved: "The cost of research may be of two kinds; the cost of doing it, and the cost of not doing it. * * * Any industry which has the will to live, must of necessity, participate in research."

The program of this group includes for coal's future study of hydrogenation; production of colloidal fuel; carbonization and gasification; the use of coal for railroad locomotives and for highway trucks.

We suggest an additional subject; an educational program to sell the public the fact that coal is the most efficient and economical fuel of both today and tomorrow.

Future of Mechanization

THE AMAZING GROWTH of mechanization in the mining field during the past two years has brought to light a fact that has been more or less obscure. Few operators have welcomed the opportunity to predict mechanization's future. It is now obvious that one of the answers to coal's problems is the application of the machine to production methods. The over-flowing exposition hall at the recent Cincinnati meeting is a direct answer to skeptics.

In discussing the economic factors that have brought about this public acknowledgment of the place of the machine, Paul Weir, well known consulting engineer, recently said: "If coal had a monopoly on the energy market, the necessity for low production costs would not have been so acute. * * * Gas, oil and hydro-electric power are worthy competitors. In addition to this, high costs of coal result in greater efficiency in utilization with a reduction in amounts used per unit of work performed. These things call for the lowest possible cost of production, so that coal may not only hold its competitive position, but also, if possible, improve upon it. With the almost complete unionization of labor employed in the coal industry during the last four years, has come relatively high wage scales which are considered to be competitive between districts and as between mines in the same district. Collective bargaining is now the law of the land. No chance for reducing costs of production by lowering wage scales exists. * * * Perhaps all of these trends can be summed up by saying that the coal industry is definitely heading toward the use of a maximum amount of labor-reducing machinery, and a minimum amount of labor."

As far back as 1919 the American Mining Congress recognized this trend, and created a series of Committees to study operating practice and recommend standard rules. The study is still going forward, with the Congress occupying its rightful place as the original exponent of the theory that "Mechanization is here to stay."

The Six-Hour Day

EVERY CITIZEN wants to see prosperous industry. The years of trial just past have left us with the conviction that such catastrophes are avoidable. In suggesting ways and means of preventing a re-occurrence, many purely Utopian ideas have been advanced, many unworkable schemes have been presented, and many untried paths seem alluring.

Labor organizations, abetted by the indisputable fact of tremendous unemployment, have urged continuously the adoption of the six-hour work-day and the five-day week. Theoretically, at least, this would seem a means to the end, but its expediency or wisdom may be challenged. A combination of short hours, high wages, and low commodity price is intriguing. More goods at less profit is a common slogan.

The factors involved in modern business are capital, labor, and management. Labor can never earn more than it produces. A six-hour day for labor would seriously handicap industry. Capital works in 24-hour shifts, but it works only when a return is promised; if the return is not forthcoming, capital must quit.

The ultimate goal for us is a system whereby there is an adequate return for capital, labor, and management. It obviously cannot be achieved today by the arbitrary application of an unsound theory.

A Skilled Labor Shortage

ABOUT A YEAR ago, in these pages, we advocated that the CCC camps could improve their usefulness if they established training schools for trade and mechanical jobs. It is therefore gratifying to note that the Administration plans to include in its 1937 program for the CCC boys such training.

As industry has gone back to work, after its long period of depression, it has found itself faced with the extraordinary situation of a skilled labor shortage. From many sources has come the information that mine, mill and factory cannot find properly trained foremen, machinists, and other skilled workers. There is an actual fear among those industries blessed with increasing business, that they cannot find enough skilled workmen to handle the orders. Apprentice schools are being started by many companies, but it is recognized that the gap cannot be quickly filled.

While all of this training is in the right direction, it is to be regretted that the Government did not see this real need long ago, and thus be ready to meet the requirements of the industries it has set itself up to aid.

A Remarkable Demonstration

PRODUCER AND MANUFACTURER combined, during the week of May 17, in a remarkable demonstration. Five thousand persons, vitally interested in the future of coal mining, spent the entire week in discussions looking to greater efficiency in operating practice. The good that will accrue to the industry through these deliberations is incalculable. Even a casual glance at the results of this meeting should convince the most skeptical that the coal industry is alive to its responsibilities, and is determined to keep coal in the front rank as an energy source.

The Federal Securities Act and its Effect on the Mining Industry

By HARRY S. SILVERSTEIN*

ONE of the strangest of phenomena met in a paper-money world is that the more men are obliged to use paper, the more they prize gold. The search for the precious metal has been one of the main causes in the major changes in world politics, discovery and explorations. Traceable to this source was the discovery of the Americas, the conquest of Peru, and the trek across the wide expanse of our western prairies to the development of California. Fresh impetus to that ever existent seeking and desire was given when President Roosevelt secured from Congress the power to change the gold content of the dollar by as much as 50 percent. At that time there were meeting at London the delegates of over 50 nations, assembled in a World Economic Conference, whose real task was to agree on a new world price for gold, then and for a long time before, standing at \$20 an ounce. So important was that conference that its parleys were opened by the late King George V, of England, in person.

That conference was like a triangle—a monetary, and not the usual marital variety—with the British Empire taking one side; the European nations, headed by France, another; and the United States yet another. While they were still wrangling, President Roosevelt utilized the power Congress had given him and cut the gold content of the dollar 41 percent. An ounce of gold was immediately fixed in price at \$35. His message sped across the Atlantic like a torpedo and sank that World Economic Conference without a trace. At any event, no one has ever heard of it since.

A jump in the price of gold from \$21 to \$35—almost double—naturally started additional thousands on the road to find new Golcondas. The average gold production for the years following the World War was around 16,000,000 to 20,000,000 oz. a year. In 1935 the production had increased to 31,000,000 oz. New strikes have been opened in the Philippines, in Labrador and Canada, in South America and Russia, in New Zealand and North

Africa. But of greater moment is the new life-blood poured into old veins. The rise in the price of gold and silver spells the difference between profit and loss for many a mine long since abandoned, and raised hopes for greater development of a large number of areas in the Rocky Mountains and the Sierras, known to be more or less highly mineralized.

But to develop a mining property, capital is needed. To resuscitate an old mine, even with known, located, and mapped ore bodies, the tunnels, shafts, and drifts must be cleaned, dewatered, and retimbered; new machinery installed; and a skilled and competent staff assembled. The time element is also an important factor, and it takes much time to accomplish these results. Is the needed capital to be raised by the old, familiar method of corporate organization, with more than half the stock to the owners or promoters, or both, and with just sufficient sold to the general public through advertising, solicitation, bombardment through the mail, or through high-pressure salesmanship? We still remember the discoveries at Cripple Creek (back in the gay nineties) and the speedy development of that camp into one of immense production. Two mining stock exchanges were active in Colorado Springs; another in Denver. I recall my amazement on my first visit to Cripple Creek at seeing active trading on their local exchange until after midnight.

The 20-year period, however, from 1910 to 1930, was a quiescent one, in Colorado, so far as concerned new developments or promotions in the precious metal mining industry. The mining of silver, except as a by-product, had practically stopped, and the people of Colorado were no longer mining-minded.

During the interval between the Cripple Creek era and 1930, many changes had occurred in the attitude of the public at large, in legislative activity, and in the outlook and approach of the investing public toward stocks and bonds, the general financial set-up, and, in general, in the manner, methods, and mecha-

nism of enlisting and soliciting capital for both new and even old and proven ventures, whether industrial, in the utilities, or for mining or other enterprises.

The first blue-sky law was passed by Kansas in 1911, in an effort to reconcile the desire for freedom in the conduct of business with adequate protection to the investing public. By 1933, all the 48 states, except Delaware and Nevada, had placed on their statute books some form of blue-sky law. These generally fall into two distinctive classes. One is the punitive type, such as the New York Martin Act, which aims to subject the dealer or issuer to investigation by state officials when a scheme or device to defraud has become operative, and generally resulting—if the fraud is established—in criminal proceedings or injunction. The other general class is the protective type, aimed to forestall the fraudulent promotion before any harm is done. The California act, started in 1917, with amendments since, is a combination of these two types, and many commentators, as well as officials familiar with its administration, and others of the public, have characterized the California act as *theoretically* perfect.

A brief interlude here as to our Colorado so-called blue-sky law. Long convinced that it was of little or no avail as a protection to an investor, and merely a nuisance to the dealer or issuer, I was interested in noting a recent comment on it by an eminent writer, as being a hybrid law—a conglomeration of isolated fragments of the British system with sundry portions of American blue-sky ideas, with resultant glaring imperfections.

The American blue-sky laws were no innovation. There was ample precedent. Continental Europe and England had—long prior to 1911—been working on and developing similar ideas. By the year 1900 the British Companies Act—one of the bases on which our S. E. C. was modeled—was in full force and effect. It required—and you will note how our own Securities Act marches along with it—compulsory registration—signatures by all directors—general information as to the company's organization, original subscribers—kinds and classes of shares—and full information concerning the management, all of the directors, officers, and promoters, including:

"Their interest in property, their interest in profits, their interest in prop-

* Denver, Colo.

erty to be acquired by the company, names of vendors of property to be acquired by the company, consideration paid to vendors of property to be acquired by the company. Commissions or salaries paid during past two (2) years. Consideration paid to promoters during past two (2) years—and disclosure of 'all material contracts' during the past two (2) years, 'not in the ordinary course of business.'"

As a practical matter, many of those present may be much interested in knowing what would be regarded as such a "material contract"—in view of almost exactly the same wording found in our S. E. C. Act. An English judge long ago defined it in plain and simple language as being:

"Every contract which, upon a reasonable construction of its purport and effect, would assist a person in determining whether he would become a shareholder in the company."

As in the case of every law designed to curb accustomed activities thought to be detrimental to the public, loopholes were discovered through which those expert and clever enough, in an unscrupulous manner, were able to slip with evasive devices, among which was that by British brokers of marketing "personally owned" securities without registration, by the method of allotting shares—intended ultimately for public consumption—to an inside promoter. All of these gaps, however, had been closed, long before our first state blue-sky law. The British Companies Act had been functioning—substantially in its present form, for about 20 years prior to 1926; and in that year a committee designated by Parliament to investigate reported to that body that the results in protection to the investing public were "on the whole satisfactory."

All of which, you are probably saying, may be highly interesting and instructive, but "what about the effect of the Securities Act on the mining industry?" Unfortunately I am not a prophet—and all of you engaged in mining—as in other business—are after profits. Had I the slightest ability to read and forecast results or probabilities from current and patent signs and portents, I would most certainly, by betting on the last election, have feathered my nest to such extent that I would in the future practice law merely as a hobby—and not, as now, under compulsion of necessity.

Let us turn then to the handwriting on the wall. We must all agree that—in the light of legislative safeguards and restrictions operating in Europe—in England—in the United States—and being enacted and contemplated in the various Canadian provinces—the day of "free and unlimited coinage" of gilded stock certificates is past. All of us interested in mining, in the orderly and legitimate promotion of mining ventures which have merit and real possibilities of development, and desirous of seeing that a proper proportion of the capital raised for that development is honestly devoted to that purpose and object—that it goes into the ground with the intent

of taking more out of that ground—welcome and gladly cooperate with the reasonable, proper, and economic administration of a securities act designed to eliminate the fraudulent promoter and to place no unreasonable hindrance in the path of legitimate mining ventures. From selfish motives alone the legitimate and honest broker and promoter would naturally favor it. The greater the amount of funds saved from absolute loss in unworthy, hopeless, visionary, and even intentionally dishonest and fraudulent mining schemes, the more capital is available for those with merit. The word "venture" is fitting and appropriate in application to the opening of a mine. Mining is necessarily speculative. It is a gamble—far more so than is the prospecting for oil. Mark Twain, who wrote so whimsically of his personal experiences in mining in Nevada and California, tells us of how British capital developed some of the richest of mines—in Africa or Australia, I've forgotten which—by following the advice of American engineers who told them—in advance—that they would have to sink over 2,500 ft. before reaching pay dirt. He contrasted this faith—in a pure gamble—with the then typical American, who expects fat returns right from the grass-roots.

In one aspect, however, there is much less of speculation or gamble in the operation of a mine producing the precious metals, gold or silver. The market is fixed—and steady—and there is no problem of overproduction. The only problem is that of production—and of reduction methods and costs. So that the figuring can be done on the basis of a fixed and constant selling price—with Uncle Sam absorbing the entire product.

In an analysis then of our Securities Act, as related to the mining industry, let us give thought, first, to that class of legislative restriction, its purpose and objects, and also, and especially, to its natural limitations. Experience teaches that there is, and can be, no legislative "cure-all" to protect people from their own folly. Legislation cannot supply people with prudence, judgment, or business habits, either of thought or of conduct. Also, on the other hand, that even a speculative venture may be honestly managed; and that, by and large, by far the vast majority of business men are inherently honest and well-intentioned. Surety and casualty companies are built and function upon that basis. Personal connection with human kind as a public prosecutor in this community has convinced me of the truth of both these extremes.

A careful reading of the Federal Securities Act reveals that after all it is bottomed on the cardinal principle that it is best to let the individual investor make up his own mind and exercise his own judgment, provided—and this is the kernel in the nut—provided he is furnished with facts upon which to base that judgment. "The ultimate responsibility for investments is, and should be, upon the individual, not upon the state." Given relevant and accurate information,

the rest is up to the judgment of the investor. The burden, the responsibility and the risk of any governmental, regulatory body attempting to pass upon the merits of any contemplated business enterprise, industrial, manufacturing, mining or otherwise, is too monumental, too much fraught with inherent, internal difficulties, dangers, and complexities to be even remotely considered as within the proper realm of the most paternalistic government.

While fully in accord, therefore, with the high purpose of the Securities Act, and its essential part in our economic structure, nevertheless—and especially as to probable effect upon the mining industry, and more notably in the case of the smaller companies, with undeveloped prospects—two possibilities of prospective dangerous situations press for attention. If this be criticism, let it be continually borne in mind that it is not in a critical or hostile attitude, but solely and only in a spirit of constructive and helpful criticism—and not otherwise.

One of the dangers—to some extent already manifest in the recently adopted form and instruction book, A-O-1, for registration of mining companies—of the tendency to so frame the requisites of information to be disclosed—so as to enable the S. E. C. to more or less pass upon the merits of the proposed offering. Not that it has yet reached that point, but, as I have said, the tendency in that direction appears. It is very easy, indeed, to shift from the role of a strictly "fraud prevention" agency to that of an "omniscient judge of business policies." It is no business whatever of the S. E. C. whether the company's plan is good or bad. Even if it has no humanly conceivable hope of success—yet if the truth and the whole truth is told, and no material fact is omitted—and if there is no misleading—then that is all that the Securities Commission can ask or require. Such is the law itself, as I read it.

The other danger—likewise not remote but already manifest in the aforementioned forms and general rules and regulations—is the one ever present—and which was broadcast in the English discussions—namely, the delays and expense incident to the administration of an elaborate regulatory act. This proceeds from a natural mistrust of administrative boards and governmental bureaus. The strong trend toward government by administrative bodies, boards and commissions was never more pronounced than right now. Such bodies have an astounding capacity for growth. The California Corporation Commission is an illustration, and yet the law itself was praised as a model of theoretical perfection. Twenty years ago its cost of administration covering a 20 months' period was \$55,000. For a like period in 1928–1930 the cost was \$765,000—over 13 times as much, and with a corresponding increase in staff. Its regulatory rules cover 50 printed pages, and—note—the office is self-sustaining;

all that cost was defrayed by fees charged and collected.

Let us come right home—to our own S. E. C., if you can call that home. I have just received a circular from Washington anent the *Federal Register*, a U. S. Government publication. You will recall that such publication—of all Executive orders and proclamations by the President, and of all other orders, regulations, certificates, codes, licenses, notices, etc.—by executive departments, was brought about and made compulsory because the U. S. Supreme Court had brought to light the fact that an important Executive or board order was involved and no one knew anything about it except one official who carried it in his pocket. It is issued *daily*. You can get it for \$10 a year, if you pay in advance. On the back of that circular are listed 2,820 different orders—having legal effect—issued in a period of eight months, by 34 different Government agencies.

The S. E. C. commission is an infant, in age, compared to the Departments of Agriculture, Interstate Commerce Commission, Interior, Post Office, Navy, Treasury, and Federal Trade Commission, and yet the orders, rules, etc., issued by S. E. C. was one-fourth of the total of all such issued by all the 34 boards and departments. It topped all the others by a long distance.

The S. E. C. Act itself contains Schedule A, listing 32 items of information required to be set forth in the registration statement. Under the power given by section 19 (a) of the act, the S. E. C. under its new A-O-1 form, lists

62 such separate items, and almost all of them are subdivided—into subsections—so that the total amounts to about 150 separate classifications of items. The instruction book accompanying Form A-O-1 consists of 13 legal size pages—in small type. Form A-O-1 is required for mining company registrations (other than oil or gas) filed after March 1, 1937. Maps are required—surface maps and underground maps. Also district maps to show locations of the mining properties. Maps of all claimed ore blocks—assay maps in detail—in large scale—so as to identify positions of assay samples on the maps showing locations of stopes, drifts, and other excavations.

To the small mining operator, who has by his own toil and effort and the expenditure of his own funds and those of his friends and neighbors, brought his prospect to a stage where the geological data and probabilities justify the expenditure of capital to properly develop, the intricacies and complexities, and the delay and expense incident to the preparation and filing of the required registration statement, with accompanying maps and documents, and the attendant prospectus, cannot be viewed with enthusiasm—but only with a sense of alarm and futility.

The required data and documents cannot be prepared without the aid of counsel, certified public accountants, surveyors, engineers, and experts. The small mining operator, in such case, may well hesitate and pause and debate whether it be not better to spend the thousands of dollars required to comply

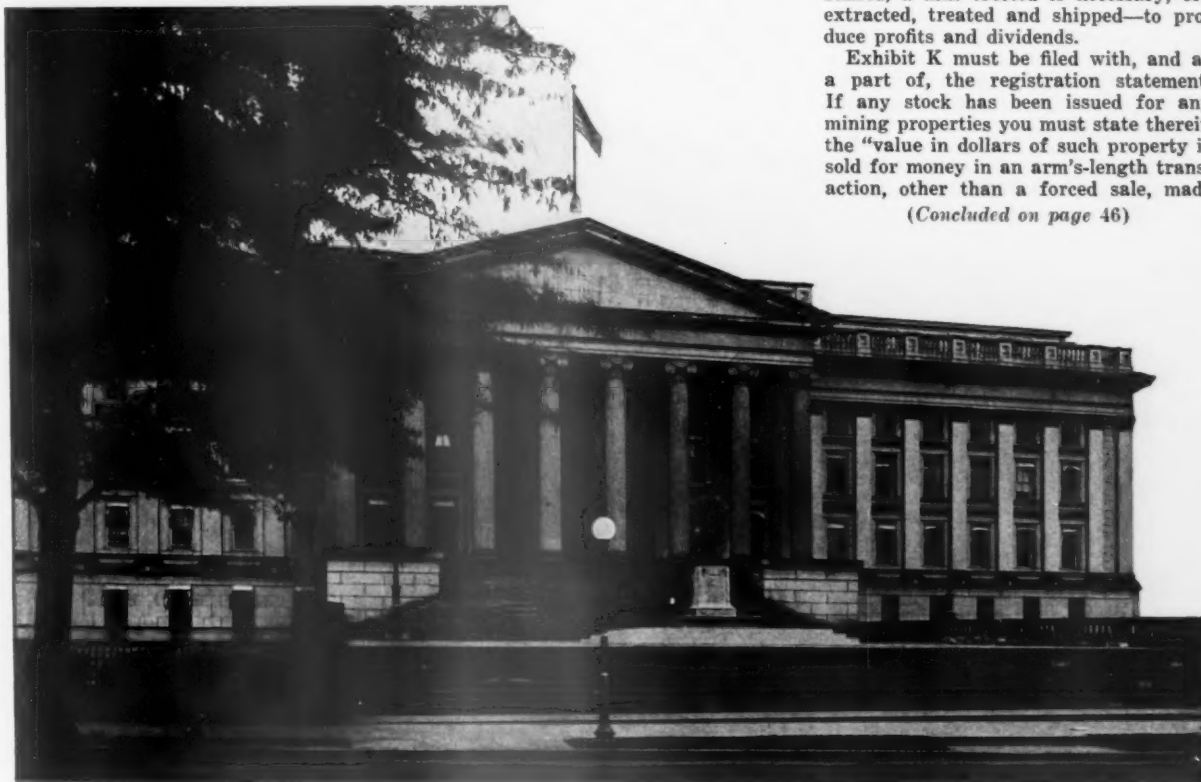
with Form A-O-1 in and upon the mine itself. To such extent then one is led to the fear that the regulations—not the Securities Law—will retard and hamper rather than further the interests of mining in our western areas.

A reading of the form and the instruction book recalls an old story. When the idea of system and of efficiency experts was abroad in the land, a salesman approached a midwestern drygoods merchant and high-pressured him into buying and installing a complete system—package carriers, card indexes, costs and freight records, form letters and follow-ups, and all the rest of it. Also several instruction books on how to run and operate it. Installation complete, the salesman departed to return in about a year. He called on his customer, and inquired how the system was working. "All right," said the proprietor. "Fine; and how is business?" asked the salesman. The answer: "Oh, business—business? Why we're all so busy attending to the system that we haven't any time to bother about business."

Another requirement set forth in the instruction book deserves mention. It was the subject of extended discussions in Denver—and through the West—between officials of the S. E. C. and miners, promoters, accountants, and lawyers. When capital is being raised for a mining venture there is neither hope nor intention that the mining property, whether prospect or partially developed or partly opened up, shall be *sold*! It is wholly with the idea that ore be opened up—the veins developed, machinery installed, a mill erected if necessary, ore extracted, treated and shipped—to produce profits and dividends.

Exhibit K must be filed with, and as a part of, the registration statement. If any stock has been issued for any mining properties you must state therein the "value in dollars of such property if sold for money in an arm's-length transaction, other than a forced sale, made

(Concluded on page 46)



Wheels of Government

As viewed by A. W. Dickinson of the American Mining Congress

THE President went fishing off the coast of Texas and caught tarpon while Congress loafed and while the newspaper writers and correspondents told the country that they thought they saw signs of revolt in the House and Senate. While the President was fishing, some of the died-in-the-wool administration men came out in the cause of "helpless minorities" and attacked his Supreme Court bill, but after that things happened pretty fast in this month of May.

First and foremost, the Supreme Court, in a series of decisions, held the Social Security Act constitutional, both as to old-age benefits and unemployment compensation. Next, Justice Van Devanter, of Wyoming, announced his resignation, thereby placing the balance of power for the immediate future in the hands of the liberal Justices of the Court. Quickly thereafter came the President's message and the wage and hour bills introduced by Labor Committee Chairmen Black, of Alabama, and Connery, of Massachusetts. In the last days of the month came the President's annual spring surprise tax message, prompted by the failure of income tax revenues to meet the estimate previously made by the Treasury Department. There surely has been no lack of action in the last half of May.

In the rulings of the Supreme Court on the Social Security Act, the old-age benefits section of the law was approved by a 7-2 vote, with Justices McReynolds and Butler dissenting. On the two unemployment compensation cases, the vote was 5-4, the dissenting Justices being McReynolds, Van Devanter, Butler, and Sutherland.

The case of Charles C. Steward Machine Company, of Alabama, involved the Federal unemployment section of the Social Security Act, and the opinion held that the tax imposed by Title IX on employers of eight or more persons was a valid exercise of congressional power, and that while the tax is levied only against certain groups, it is not arbitrary or capricious.

In the case of the Alabama State Unemployment Compensation Act tested by the cases of the Southern Coal and Coke Company and the Gulf States Paper Corporation, the opinion held that a state has the right to levy taxes for its general welfare and that the question of whether conditions warrant such action is within the knowledge and power of the legislature and not of the courts.

The test of the old-age benefits section

and its tax under Title VIII came from Massachusetts and was brought by a stockholder of the Edison Electric Illuminating Company. The right of Congress to levy taxes for the general welfare was made clear in all of the opinions.

It is not anticipated that there will be more than minor amendments to the Social Security Act in this session. A joint announcement by Senator Pat Harrison, chairman of the Finance Committee, and Arthur Altmeyer, chairman of the Social Security Board, confirmed the appointment by a special finance subcommittee consisting of Chairman Harrison and Senators Byrd, of Virginia, and Vandenberg, of Michigan, together with the Social Security Board, of an advisory council of 24 persons for the consideration of changes in the Social Security Act.

It is announced that the advisory council will consider:

1. The advisability of commencing payment of monthly benefits under Title II (old-age benefits) sooner than January 1, 1942.
2. The advisability of increasing the monthly benefits under Title II for those retiring in the early years.
3. The advisability of extending the benefits in Title II to persons who become incapacitated prior to age 65.
4. The advisability of extending the benefits of Title II for survivors of individuals entitled to such benefits.
5. The advisability of increasing the taxes less rapidly under Title VIII (old-age benefits).
6. The advisability of extending the benefits of Title II to include groups now excluded.
7. The size, character, and disposition of reserves.
8. Any other questions concerning social security about which either the Senate committee or the Social Security Board may desire the opinion of the advisory council.

The appointees on the advisory council are:

Representing Employers:

C. M. Bugniet, International Brotherhood of Electrical Workers, and president, Union Cooperative Insurance Association.

Harvey Fremming, Oil Field, Gas Well & Refinery Workers' International Union.

John P. Frey, president, Metal Trades Department, A. F. of L.

Sidney Hillman, Amalgamated Clothing Workers.

Philip Murray, United Mine Workers of America.

Matthew Woll, American Federation of Labor.

Representing Employers:

Marion B. Folsom, Eastman Kodak Company.

Walter D. Guller, Curtis Publishing Company.

Jay Iglauer, Halle Brothers Company. M. Albert Linton, Provident Mutual Life Insurance Co.

E. R. Stettinius, Jr., chairman of the finance committee of the U. S. Steel Corporation.

Gerard Swope, General Electric Company.

Representing the Public:

J. Douglas Brown, Princeton University.

Henry Bruere, Bowery Savings Bank. Paul Douglas, University of Chicago.

William Haber, Michigan Unemployment Compensation Commission.

Alvin H. Hansen, University of Minnesota.

Lucy R. Mason, National Consumers' League.

Theresa McMahon, University of Washington.

A. L. Mowbray, University of California.

T. L. Norton, University of Buffalo. George L. Stocking, University of Texas.

Elizabeth Wisner, Association of Schools of Social Work.

Edwin E. Witte, University of Wisconsin.

With the Supreme Court approval of the Social Security Act and the resignation of Justice Van Devanter, coupled with the determined opposition of certain minorities, the pressure for enactment of the President's bill calling for an increase in the number of Supreme Court Justices has materially lessened. It is true that there has been no administration announcement that the desire for the passage of the measure has decreased, but it is quite apparent that many of the things which the administration has hoped for have been accomplished.

In the latter part of the month the long anticipated wage and hour legislation was carried to the Congress by a message from the President, immediately followed by the introduction of bills calling for the outlawing of child labor and for minimum wage and maximum hour standards. The bills introduced by the

chairmen of the Labor Committees of the Senate and House, Senator Black, of Alabama, and Representative Connery, of Massachusetts, are identical except for minor provisions. The House bill would place imported articles entering into interstate commerce under the same prohibition as to labor and wage standards as is contemplated for domestic articles. In the Senate bill there is no mention of imported articles. This feature would embarrass the State Department in its conduct of the reciprocal trade agreement program and will undoubtedly be eliminated. The bills are now the subject of hearings being conducted jointly by the full membership of both of the Labor Committees. It is evident from the procedure that it is the intention of the administration to expedite the enactment of a bill and the number of witnesses is being held to a minimum. The major provisions are as follows:

1. Creation of a labor-standards board of five members, authorized to declare as a policy of Congress from time to time maximum work week and minimum hourly wage standards in particular industries or occupations with differentials based on geographic, economic and in-

dustrial conditions prevailing at the time. Board members would serve five year terms receiving \$10,000 per annum.

2. "Oppressive wage" and "oppressive workweek" are defined to mean wages lower than the minimum or a work week longer than the maximum which are to be written into the bill by Congress (at the present time most seriously discussed as 40 hours per week and 40 cents per hour). Board shall extend the application of the "oppressive wages" and "oppressive workweek" provisions by regulation or order as rapidly as such can be made applicable without unreasonably curtailing opportunities for employment. In doing so, it may revise the wage and hour figures as stipulated in the bill upward or downward to the extent found necessary or appropriate.

3. "A fair wage" is defined as one fairly and reasonably commensurate with the value or class of the service rendered and "a reasonable workweek" as the number of hours of employment in a week reasonably suitable to the nature or class of service rendered.

4. The Board is directed to investigate wages and hours in any industry or occupation where it has reason to believe that, owing to the inadequacy or ineffec-

tiveness of facilities for collective bargaining, wages are being paid to employees, "substandard" conditions prevail, and after hearings shall by order establish fair wages and reasonable workweeks.

In determining and establishing a minimum fair wage for any service or class of service, the Board (1) shall take into account the cost of living and all other relevant circumstances affecting the value of the service or class of service rendered, (2) shall be guided by like considerations as would guide a court in a suit for the reasonable value of services rendered where services are rendered at the request of an employer without contract as to the amount of the wage to be paid, (3) shall consider the wages established for work of like or comparable character by collective labor agreements negotiated between employers and employees by representatives of their own choosing and (4) shall consider the wages paid for work of like or comparable character by employers who voluntarily maintain fair wage standards in the occupation to be subject to the order establishing such minimum fair wage; but the Board shall not establish a minimum fair wage which in the judg-



June in Rock Creek Park, Washington, D. C.

ment of the Board will give employees receiving not more than such minimum fair wage an annual wage income in excess of twelve hundred dollars, or an hourly wage in excess of 80 cents except for overtime, night, or extra-shift work.

5. Authority to fix maximum hours of overtime which could be worked over and above the standard week is vested in the Board. No penalties would be assessed against employers paying time and one-half for such overtime.

6. Child labor under 16 would be prohibited except that the minimum age would be 18 years in occupations classed as hazardous by the Children's Bureau and in the production of goods for shipment into states having laws setting 18 as the minimum age.

7. Hiring of strike-breakers, "labor spies," etc., is defined as "oppressive labor practice" and is prohibited.

8. The right of workers to bargain collectively is expressly safeguarded to enable them to secure more than minimum standards.

9. Board is granted wide powers to stop substandard practices which "tend or lead" to labor disputes; it also is given authority to seek to prevent "the established minimum wage becoming the maximum" and the "discharge or reduction in wages of employees receiving more than the minimum."

10. Board is given authority to fix standards of wages and hours in *intra-state* industries as well as interstate if the former affect interstate commerce.

11. Goods produced in violation of the standards set are defined as "unfair goods," their movement in interstate commerce is barred; records of the manufacturer and a requirement of certain types of labeling and marketing of such goods are set out. The House bill extends jurisdiction over goods imported into the United States; the Senate bill gives jurisdiction only on domestic goods.

12. Authority to set up advisory committees, regional offices and agencies is granted the Board.

13. A declaration of policy in the bills declares: "... substandard conditions ... obstruct ... the free flow of commerce" and also affect the workers' health and well-being, impair price "stability" and "orderly" marketing and constitute "unfair" competition.

14. Penalties for violation of the Act's provisions are fixed at a fine of \$500 and/or six months imprisonment; for discharge or discrimination of an employee in connection with any provisions of the Act the fine is \$1,000 and the prison term is one year on each count to enforce cooperation with the Board's orders and maintenance of standards.

15. The Act becomes effective immediately upon enactment, but compliance with the fair labor standards established by the Board may not be required until 120 days after enactment.

The President's message of June 1, which centered on tax evasion and avoid-

ance is important to the mining industries because it unfortunately includes in the quotation of the recent report of the Secretary of the Treasury a reference to the percentage method written into the law to simplify procedure in arriving at the depletion deduction which Congress originally voted in 1913, in recognition of the equity of such deduction for the wasting mineral assets of mining enterprises.

The Treasury estimates of the income tax revenue for the taxable year 1936, had fallen short by over \$600,000,000 when a quick check up was made of the returns as of March 15, 1937. In addition to this fact, the complexities and injustices of the Undistributed Corporate Earnings Tax had caused thousands of corporations to ask for extensions of time in which to file returns. The only reason that can be assigned for the inclusion of the percentage depletion deduction in the report of the Secretary of the Treasury is his statement to the effect that \$75,000,000 in additional revenue lies in this source. The laws as enacted and the report on depletion by the staff of the Joint Committee on Internal Revenue Taxation (issued in 1929) fully justified the item as an equitable and proper treatment, carefully developed in the interest of the simplification of the problems involved in the administration of the income tax law.

In his tax message the President urged legislation at this session "specifically and exclusively aimed at making the present tax structure evasion-proof." He quoted the recent letter from the Secretary of the Treasury, enumerating the following eight methods by which the collection of taxes is now being defeated:

"(1) The device of evading taxes by setting up foreign personal holding corporations in the Bahamas, Panama, Newfoundland and other places where taxes are low and corporation laws lax.

"(2) The device of foreign insurance companies.

"(3) The device of domestic personal holding companies.

"(4) The device of incorporating yachts and other estates.

"(5) The device of artificial deductions for interest, losses, etc.

"(6) The device of the creation of multiple trusts for relatives and dependents.

"(7) The device of husband and wife or father and children partnerships.

"(8) The device of pension trusts."

The letter further proceeds with the following:

"In addition to these cases of moral fraud, there are three other major instances in which the law itself permits individuals and corporations to avoid their equitable share of the tax burden.

"1. *Percentage depletion.*

"This is perhaps the most glaring loophole in our present revenue law. Since 1928 large oil and mining corporations have been entitled to deduct from 5 to 27½ percent of their gross income as an allowance for the depletion of their

mines or wells, and the deduction may be taken even though the cost of the property has been completely recovered. Thus, in 1936, one mining company deducted nearly \$3,000,000 under this provision, although it had already completely recovered the cost of its property. The amount of the deduction was a sheer gift from the United States to this taxpayer and its stockholders, and the revenue that we lost thereby was \$818,000. Similar annual losses of revenue in the cases of a few other typical companies are \$584,000; \$557,000; \$512,000; \$272,000; \$267,000; \$202,000 and \$152,000. The estimated annual loss of revenue due to this source alone is about \$75,000,000. I recommended in 1933 that this provision be eliminated but nothing was done at that time and it has since remained unchanged."

"2. *The division of income between husband and wife in the eight community property states.* ...

"3. *Taxation of nonresident aliens.* ..."

In conclusion, the Secretary of the Treasury states that the instances given have been disclosed by a quick check of comparatively few individual returns—that most of the large corporation returns have not yet been filed and that the general audit of the 1936 returns is just beginning.

The Senate and House acted on the President's message by passing a joint resolution to create a Joint Congressional Committee on Tax Evasions and Avoidance to consist of five members of the Committee on Finance of the Senate and five members of the Committee on Ways and Means of the House of Representatives. The committee is to investigate and hold hearings and to report back to the Senate and the House not later than January 5, 1938, its recommendations as to remedies for the evils disclosed by such investigations. It is anticipated that there will be some corrective legislation in the present session of the Congress to cover what are considered to be the immediate and most important needs of the Treasury. The investigating committee will in all probability call before it, individuals such as are referred to in the report of the Secretary of the Treasury.

The Stream Pollution bills were not active during the past month with the exception of a pollution survey authorized for the Ohio Basin in the omnibus Rivers and Harbors bill. It is said that the Barkley-Vinson Water Pollution bill will be reported by the Senate Committee on Commerce without the amendment and that Senator Loneragan, who is the advocate of a mandatory type of bill which would make it unlawful to deposit polluting material of any character in a stream, will endeavor to amend the Barkley-Vinson bill on the floor of the Senate.

During the month, the Senate confirmed the nominations of seven members of the National Bituminous Coal Commission; and after reelecting Chairman C. F. Hosford, Jr., the commission has

(Concluded on page 48)

Of All Things . . .

The rest of the country laughed at Vermont not so long ago. . . . But Vermont has the last laugh . . . and the cheapest one. . . . She recently repealed her amusement tax. . . .



One thing Uncle Sam doesn't have to do is buy government bookkeepers rose-colored glasses. . . . Not, at least, until the figures get out of the red ink stage. . . .



The Administration is intent on banning evil from the land. . . . It has recently buried 49 carloads of gold deep in the earth after generations of men lost their lives in bringing it from the earth. . . . Probably on the theory that money is the root of all evil, Uncle Sam is going to bury the root. . . .



What a swell place for Supreme Court controversy India is going to be! . . . Its new constitution is 600 pages long. . . .



Florida opponents of their ship canal contend that it will drain away fresh water sources in the state. . . . We'll be getting some place when someone starts contending that what it will really drain is the U. S. Treasury. . . .



This Administration has certainly changed current thought. . . . Time was when small boys, arguing with one another, were willing to "bet a million." . . . Nowadays their bets run into the billions. . . .



Well, the President's request for another \$1½ billion to finance recovery and relief brings the cost of that little item since Mr. Roosevelt took office to a cool \$21½ billion. . . . Just how astronomical a figure that is can be realized when one stops to think you could pace a road to the moon with \$50 bills and still have some left over. . . .

Next year is political campaign time. . . . So don't be surprised to see some candidate promising sit-down strikers rocking chairs, smokes and magazines. . . .



The French "popular front" government hasn't had much trouble since it adopted an unbalanced budget. . . . Just taking a leaf from Uncle Sam's book, eh? . . .



A generation ago the Nation was anxious to have more people per square mile. . . . Nowadays what we need is more square people per mile. . . .



It was nice to have the West Point cadet corps marching in the presidential inauguration parade . . . even if they got a bit wet and bedraggled. . . . The taxpayers got a soaking in the deal, too. . . . It cost \$33,336 to bring them to Washington. . . .



Everybody thinks the New Dealers have their hands in everything. . . . Pshaw! . . . They haven't set a minimum on the number of berries on a strawberry shortcake, yet. . . .



The Administration isn't interested in conducting an unemployment census. . . . Which leads to the suspicion that the widely different unemployment totals make good political fodder. . . .



Well, we don't know that we can blame Mr. Roosevelt for vetoing that \$5,000,000 appropriation for the New York World's Fair. . . . Maybe he's been looking over the figures and found that since 1873 the Federal Government has shelled out \$35,000,000 for 46 exhibitions and fairs of various kinds. . . .



Cutting Requirements For Conveyor Mining†

By J. O. CREE*

THIS paper, "Cutting Requirements for Conveyor Mining," has been developed after an interchange of ideas and consultation with coal mining operators in the southern West Virginia coal fields, and it is supplemented by our combined personal observations and actual experiences. Mine managers, shift bosses, and mining machine operators have expressed themselves on this subject, and the purpose here is to relay the general tenor of their opinions and experiences to you through this paper.

In presenting this subject, three major topics are individually discussed, as follows:

1. Methods of Mining Machine Operation in Connection with Conveyors.
2. The Amount of Power Necessary for the Mining Machine.
3. The Human Element in Operation and Maintenance.

Because of the abundance of subject matter, many details could be included, but only brief statements on these three major topics will be given.

METHODS OF MINING MACHINE OPERATION IN CONNECTION WITH CONVEYORS

A general description of the methods for using mining machines in connection with conveyor mining will be presented in order to give the results of time studies and also to explain the reasons for the systems used.

A. Continuous Operation of Mining Machines

Where the conveyors are operated almost continuously, loading operations, either by hand or by mobile loaders, are in progress on a part of the face at the same time that a mining machine is cutting on another part of the face. One mining machine is used with each room conveyor, and the usual practice is to designate one face employee as the machine operator. The duties of this operator are to keep sufficient coal cut, so that the conveyor can operate continu-

ously. This one employee must shovel the "bug dust," set the "jacks," and, in fact, perform all the usual duties pertaining to the operation of the machine. For normal operation of this system, these additional duties seldom cause delays in maintaining sufficient coal.

Time studies, as given by several operators, indicate that actual cutting operations vary from two hours to five hours out of each seven-hour shift. The width of the face, the number of complete times of crossing the face per shift, the speed of travel by the machine, the character of coal cut, and other conditions have a direct bearing on the actual time of cutting operations. This actual cutting time is usually about two and one-half to three hours for normal operation.

The machine operator may be assigned the duty of drilling the coal, preparing the shots, timbering, loading, or other dead work for the remainder of the shift. Some time during each shift should be allowed for maintenance of machines.

B. Intermittent Operation of Mining Machines

Another system is to assign two employees to the mining machine, and then loading operations on the entire face are completed before the next mining machine cut is made. The length of the face, method of roof control, type of equipment used, and whether one mining

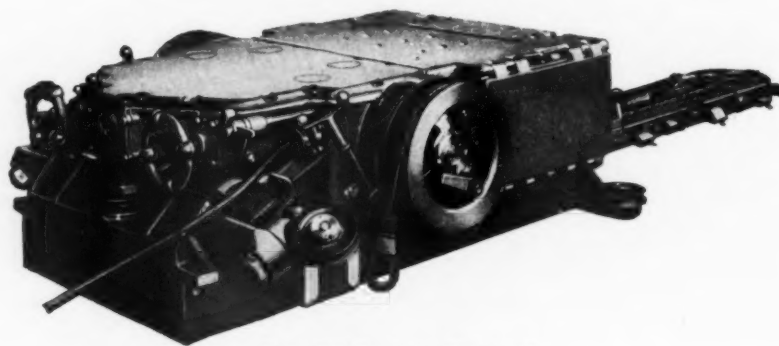
machine shall be used for one or more room conveyors are some of the factors that dictate the use of this system. Where this system is used, every effort is made to complete the cut as rapidly as possible, in order to resume the loading operation. The number of complete faces cut per shift depends upon conditions at the particular mine, but seldom is the actual cutting time more than four hours for each machine per shift.

Therefore, it develops that the selection of the particular system of conveyor mining to be used depends upon local conditions, such as safety, timbering, method of roof control, type of equipment used, and other factors. Then the mining machine's operation is made to suit these local conditions and also the particular conveyor system used. The depth of the machine cut, now that more experience has been gained from the proper use of explosives, is determined in most cases by the length of the conveyor sections, which is either 5 or 6 ft. The machine cutter bars are usually changed to suit the lengths of the conveyor sections if appropriate bars are not already in place on the machine.

THE AMOUNT OF POWER NECESSARY FOR THE MINING MACHINE

The amount of power necessary for mining machines used with conveyors has been chosen as one of the major topics because of its importance.

Conveyor systems, which include the mining machine, have been developed on a shift basis, and to obtain efficient operation, an adequate power supply must be



Type 512 Goodman Shortwall

* West Virginia Engineering Company.
† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 17, 1936.

maintained. The power supply can be either direct or alternating current.

For direct-current power supply, the speed of the conveyor is dependent in almost a direct ratio upon the voltage delivered at the mining machine. Periods of low voltage result in slower conveyor operation, which in turn affects face production. Low voltage affects the mining machines, causing slower operation. Most operators have found that feeder circuits from the substations to the conveyor sections have been necessary. In some instances the substations have been moved to locations in the center of the conveyor sections. Frequent power interruptions from other mining activities have been eliminated by erecting independent power circuits for these conveyor units and their mining machines.

For the alternating-current power supply, the voltage supply again must be considered, for lower than normal voltage causes the motors to stall due to impaired torques. Suitable circuits are necessary to maintain the proper operating voltage. When distances become too great for the desired operating voltage, the procedure is to move the transformer bank nearer the conveyor location.

An adequate supply of either alternating- or direct-current power must be given consideration. The capacity of the power source should be sufficient for all normal peak electrical loads for the machinery used.

Because of the usual intermittent operation of the equipment, a diversity factor of about 75 percent of the total horsepower connected in motors used in the conveyor system should be provided for the necessary normal capacity required. With such capacity available, frequent power outages which cause delays in production, will not occur.

The results of seven actual tests of mining machines when cutting coal with direct-current power are given for electrical energy in kilowatt-hours per ton of coal used at the machine.

Test	Places	Average width	Kw.-Hrs. per ton
1.....	6	30	.421
2-a.....	4	20	.348
2-b.....	4	20	.222
3.....	5	20	.349
4.....	4	40	.500
5.....	3	30	2.1
6.....	1	35	.407
7.....	1	40	.25

These particular tests have been chosen to make the data comparable, because the thickness of the coal seam was approximately 3 ft. and the undercut in each case was 6 ft.

The standard makes of machines were used with the usual thickness of kerf.

A few details pertaining to these tests should be mentioned. The data in test 2 is a comparison of the standard cutter bit with an alloy-tipped bit. Bit tipping is only mentioned here without elabora-

tion, as numerous articles have been prepared on this subject.

The data for test 5 is exceptionally high. This is due to a machine operating in 27-in. coal where rock and slate below the seam were cut to give extra height. The cutting at this particular mine is the most difficult ever observed in all my tests of power used for coal cutting.

The power requirements have been given in kilowatt-hours because this is the universal yardstick, so to speak, for the measurement of electrical energy and includes both voltage and current. The measurements are given as power at the machine, and no attempt has been made to include power transmission or conversion losses. These results should be multiplied roughly by two in order to obtain the total power registered at the purchasing meter or power house.

Summarizing this discussion of power use necessary for the mining machines of conveyor systems, we may restate the primary factors involved, as follows:



The Sullivan "Dual Duty" Coal Cutter

First, adequate voltage and capacity are necessary in order to obtain good operating conditions with a minimum of power outages.

Second, the results of the power use tests show a variation between .5 and .348 kw.-hr. per ton at the machine, which variation depends upon the nature of the coal cut, test 5 and the alloy-tipped bit not being included as they constitute special cases.

Third, general observations and other tests indicate that in most cases local conditions should justify experiments being made in order to develop the proper machine bit as to shape and hardness, and the proper cutter chain speeds for the particular seam of coal, and the rate of travel across the face.

Ordinarily, cooperation between the mine management and the mining machine manufacturer will result in determining exactly the best shape of cutter

bit and thickness of kerf; also the most appropriate chain lacing, cutter chain speed, and machine feed across the face for any particular seam of coal.

When attention is given to these factors and the methods of operation, and the equipment selected is best for the particular condition involved, then better machine operation and a minimum use of power can be expected. Incidentally, it is a proved fact that the proper maintenance for a mining machine results in lower power use.

THE HUMAN ELEMENT IN OPERATION AND MAINTENANCE

The human element in operation and maintenance of the mining machine has been taken as a major topic because under this category can be explained some important conditions that should not be neglected.

Using conveyor systems on a shift basis requires at least two, and sometimes as many as four, individuals for the operation of one mining machine. Conditions are such that unless close cooperation is maintained between shift crews, the old expression, "Let George do it," will apply. Proper lubrication, frequent changing of the cutter bits, and reporting minor defects are often disregarded or neglected on one shift, the men expecting that the next operating shift will attend to these particular matters. Neglect of these minor items may develop into a major defect and cause definite delays.

Frequent changing of cutter bits should not be neglected, as sharp bits produce faster cutting, relieve the mechanical parts of the machine of unnecessary loads, and reduce the power consumption.

The shape, size, and hardness of cutter bits are controlled in the process of sharpening. Blacksmiths, or the employes responsible for sharpening the machine bits, should be encouraged to watch the condition of the dull bits when received for reshaping. Often changes in cutting conditions will be noticed first by the blacksmith, and a slight change in the process of sharpening will result in more satisfactory machine operation.

Mining machines used with conveyors are normally left at the face and taken to the shop only for major repairs.

(Concluded on page 48)



Jeffrey 35-L Low View Shortwall Coal Cutter

Lowering Costs by "Rubber Tired" Mining†

WE HAVE known that the weak link in efficient mechanical loading has been the inability to adequately serve the loading machine with transportation facilities so as to obtain a greater percent of profitable work from the crew assigned to the loading unit. The tonnage that passes over the loading machine conveyor determines the production cost. The employees are on an hourly wage basis and every minute that the loading machine is idle waiting for cars, or moving from room to room, the benefits from mechanical loading are diminishing.

In seams of 6 to 9 ft. in thickness, accommodating large mine cars and large capacity loaders, the daily production has appeared to be satisfactory when utilizing only a small percentage of the loader capacity. In seams of 5 ft. or less in thickness there is not the allowable clearance to build as powerful loading machines, or as large mine cars. The results—thick seam mines and open pit mining had a decided advantage over the thinner seam mines.

From Saline County, Illinois, there has come a different type of mining. The producing territory in the mine has been cut loose from the restrictions of mine rails or conveyor belts by combination tractor-trailers equipped with pneumatic tires of such size that they float the load on the normal mine floor. In bringing out this system the writer and the organization at Blue Bird Mine, apparently, were the only ones who believed that coal could be hauled on the mine floor.

The Blue Bird Coal Company were open pit operators but controlled a large tonnage of coal 50 to 58 inches thick under cover too deep to profitably strip. The underground mining was to start by drifting in from the strip pit. The plan decided on in February, 1936, called for a caterpillar mounted cutting and shearing machine, caterpillar mounted 8 B. U. Joy loader, three storage battery tractors, three bottom dump trailers, a portable transfer station with hopper, feeder, and a belt extending from the transfer station to 70-ton railroad cars operating on the old strip pit track.

The underground development plan was based on drifting in along a 1,200-ft. face from the abandoned strip mine with the rooms worked 90 degrees to normal practice, so that all room breakthrus

were cut, then the room slabbed the full length. With the exception of the caterpillar type cutting and shearing machine, which has not yet been delivered, requiring substitution of two used short wall machines, the equipment went into service on August 11, 1936.

The loading machine was standard equipment of the Joy Manufacturing Company. The 8 B. U. size was selected as best suited for the seam that varied from 50 to 58 in. in thickness. The tractor was a different problem. Our design called for a maximum height of 42 in., a length of not over 96 in., dual pneumatic tires, the ability to handle a 3-ton trailer with an unbalanced load, and primarily, to have a motor, gearing and axle that had been tested in industrial service. The Baker Raulang Company of Cleveland agreed to absorb the development cost and bring out the mine type tractor.

The trailer was quite a problem. The most satisfactory height was a unit of 30 in., with a body having a top, 6 ft. 3 in. wide and 10 ft. 6 in. long. The first attempt at design was along mine car practice. The dead weight was out of proportion to the carrying capacity. Further study of the case revealed that the first assumptions were wrong. The trailer did not have the impact of cars in trips and with pneumatic tires, was free from most of the jars. The weight was reduced to a minimum, gauge material was used for sides and ends, with adequate bracing to secure rigidity. The trailers were built from the writer's designs, at the Blue Bird Coal Company shops with the exception of the drop bottom doors which were purchased from the Sanford Day Iron Works, Inc.

The 4-ton capacity hopper, feeder and conveyor frame are specially designed units that can be unbolted in sections and moved within the entries of the mine, and reassembled with minimum labor. These were furnished by the Barber Greene Company.

The first 30 days' operation demonstrated that the system was sound. The tractor-trailers with dual tires rolled their own roadway, the drivers handled

the units within the limits of the entries, around timbering and backed into exact position for loading with speed and accuracy. During loading they followed the movement of the loader nearly perfectly. After nine months of service a duplicate unit has been ordered for August, 1937, delivery, with no major changes in design of the equipment.

Starting with a personnel unskilled in this type of mining (that had been transferred from open-pit mining, and handicapped with heavy draw slate to handle that required stopping the loader to remove the slate at the back of the fall), the production from the 8 B. U. Joy has gradually stepped up from 200 to 300 tons per shift, with hour runs of 75 tons when operating on the slab where the draw slate had been removed, so that the loader was not required to stop. The same type of machines loading into mine cars in a neighboring mine produced between 175 and 200 tons per shift.

The second installation went into a mine of the Hart Coal Corporation, Mortons Gap, Ky., and the third installation into the mine of the Moffat Coal Company at Sparta, Ill.

Mr. Brent Hart, president of the Hart Coal Corporation, having previously attempted mechanical loading in competition with the hand loading at the Moss Hill mine and having abandoned two practically new loaders to return to hand loading, naturally studied this system very critically. He ordered a duplicate of the units used at Blue Bird Coal Company mine, the first unit going into double shift operation on March 3. It was immediately followed by unit two and, on the performance of this set up, units three and four have been ordered for fall delivery. The equipment is operating in a 60-in. seam delivering coal into mine cars of 1.4-ton capacity at the rate of 28 tons per man employed, based on coal delivered at the tippie.

Messrs. J. D. Moffat, Jr., and Andrew Moffat were operating 7 B. U. Joy loading machines in a 62-in. coal seam, loading directly into 2-ton capacity mine cars

(Concluded on page 48)

* Consulting Engineer, Chicago.

† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 17, 1936.



Seventy Miles of Railroad in This Open Pit Mine

—The Picture Story of Steel.

Safe Use of Electricity in Open Pit Mining

By A. C. BUTTERWORTH*

THE use of electrical power in the operation of the open pit iron mines of Minnesota and Michigan has shown a slow but definite growth in variety of applications during the past 30 years or more, with a corresponding variety of safety problems. These power applications include general lighting and power for operation of shops, pumps, compressors, churn drills, electric shovels and draglines, electric haulage, and various types of screening, crushing, washing, drying, and sintering plants generally included under the designation of ore treating or concentrating plants.

Utilization voltages include 110, 220, 440, 2,300 and 4,000 volt A.C. power and 250 and 600 volt D.C. power. Both stationary and portable equipment is used.

Important developments have occurred in the past few months to increase safety in the use of high-voltage portable equipment and portable power cables.

In the suggestions of 20 years ago that power shovels in the pits be operated by electricity rather than steam, it was realized that the operating voltage

would have to be high, on account of the power requirements. The apparent necessity of using overhead three phase power circuits to the shovels seemed to be an insurmountable obstacle. In the early twenties, when the rubber-jacketed high-voltage portable cable in substantially its present form was made available, interest in electric shovels in open pit mining began to be really apparent. At present there are more than 50 electrically-operated shovels and drag lines in service in the Lake Superior Iron Mining District.

The first stage in the development of a suitable high-voltage portable cable naturally included only the necessary insulated conductors to transmit the required current at the operating voltage, all encased in a suitable covering or jacket. No attention was paid to the possibility that a ground circuit of ample conductivity might be required, and the first cables were simply three-conductor cables for the transmission of three-phase power. In the comparatively high altitude of one of the western copper mines it was found necessary to improve

the design by providing a ground sheath of woven copper braid over each insulating conductor to minimize the corona cutting of the rubber insulation.

The earliest cables of the rubber-jacketed type for shovel service in the Lake Superior District were purchased about 1925, and were of the "shielded" or copper braid type. Advantage was taken of this construction, and the three braids were combined into one conductor or clamped together with copper clamps, and connected to the shovel frame at one end of the cable, and to a ground rod or pipe, or, in the case of a 4,000 volt power circuit, to the ground line itself, at the other end of the cable. Thus a double degree of protection was obtained; first, a continuous metallic circuit was made between the "ground" and the shovel frame, and second, the individual conductors being protected by grounded shielding tended to make the cable safer for handling while carrying power.

A recent fatality at one of the electric shovels in this district, in which the shovel runner was electrocuted as he started to climb up from the ground, drew the attention of all mine operators to the necessity of an investigation of the condition of cables and grounds. It was found that many apparently first class cables contained ground circuits of high resistance, and that many sup-

* Electrical Engineer, Pickands, Mather & Co.

posedly good ground points were very poor. Extensive ground resistance readings were taken, both of grounding systems and of various types of equipment standing on the ground and presumably grounded through large contact area. Many readings were also taken of the ground resistance of the soil itself. These results, while fairly consistent in any given location, were widely at variance as between different mines or districts, or even different locations at the same property. Some interesting theories have been evolved, but at present the only safe conclusion is that, irrespective of general physical indications, moisture, character of the soil, depth of contact points or area of contact, the only sure way of knowing the ground resistance is to measure it.

The portable power cables are of course the most vulnerable portion of the entire circuit, due to blasting hazards, rough handling, mechanical strains, and exposure to heat, cold, sunlight, moisture and soil acids.

The present type of cable used in the Lake Superior District is still the three conductor, rubber-jacketed, shielded type, but with one or more supplementary ground conductors in the cable core. Different mines have different methods of handling these cables in service. Some shovels are equipped with reels from which the cable is paid out as the shovel advances along the cut. Others have trailing sledges or "stone boats" on which the excess cable is carried. Still others are equipped with cable pulling rings for dragging comparatively short loops of cable behind the shovel. In many cases the excess cable is simply laid on the ground in long reverse curves by the pit crew and carried forward with the shovel as required. These cables must be handled "hot," because the shovels must move under their own power. In one or two instances, the use of long insulated tongs is being tried, but in practically all cases the cables are handled with bare hands. For this reason, primarily, a properly shielded cable is considered absolutely necessary for service in the mines of this district.

Even prior to the recent investigations it was generally realized that the actual ground resistance of an electric shovel standing on the ground might be very high, due to the condition of the ground itself, and in conformity with the general principle that all "dead" metallic parts of an electric circuit should be grounded, the shielding in the original cables was used as a ground lead, without appreciation of the necessity of permanent low resistance in the ground circuits. Indeed, instances have come to light in which some operators have used the shovel itself as a "ground," considering that of course it must be grounded because it was standing on the ground. Although technical analysis had been made of possible hazards due to high resistance grounds or faulty ground circuits, the operators generally were unaware that these conditions existed in their own equipment.

The total resistance to current flow in

a circuit is called "impedance." In any constant voltage circuit the total current flowing is inversely proportional to the impedance of the circuit. When a motor, such as the main motor of an electric shovel, is connected to a power source and running light, its impedance is high, and the current is limited to just enough to keep the motor running. As load comes on, the internal magnetic reaction of the motor causes its impedance to drop a little, and the current automatically increases with the load. If, however, a short circuit should occur in the cable leading to the motor, the impedance of the motor would have no effect, and the short circuit current would be limited only by the impedance of the power line itself. This must necessarily be kept quite low, in order to have good voltage regulation at the shovel and prevent excessive heating of the conductors, and therefore these short circuit currents can easily become very great before the protective circuit breaker opens the circuit, though this may require only a fraction of a second.

Most iron mines in the Lake Superior District purchase power at 2,300 volts for local use. The standard way to connect a three-phase transformer bank to obtain this voltage would be with both primary and secondary windings across the full system voltage, or as it is commonly known, "Delta-Delta." In some cases where the load is heavy or the distribution system is quite large, the transformers are installed with one secondary lead of each transformer connected to its corresponding bus, and the other secondary lead of each transformer connected to a common bus. This connection, commonly known as "Delta-Star," makes possible a secondary voltage of 4,000 volts, using standard 2,300-volt transformers, and results in lower currents for the same amount of power, and consequently smaller power lines and cables, or saving in power loss.

In the "Delta-Delta" connection, there is no definite point of electrical connection between the 2,300 volt system and the ground, and if no accidental ground occurs on the system, absolute ground potential will be found to wander around in the electrostatic field, generally approximately in the center of the three voltages. If you were to connect an ordinary voltmeter or lamp between the ground and a line wire of an absolutely ungrounded system there would be no steady indication of voltage difference or current flow, but the other two line wires would immediately be raised to full line voltage above ground. In other words, a single accidental ground can occur on an ungrounded power system without affecting its operation whatever, and several instances have been known where 2,300 volt systems have been operated for some time after an accidental ground was known to exist before the system could be killed and repairs made.

This would also apply to the "Delta-Star" connection, but only in those rare cases where the common bus was completely insulated from the ground. However, the general practice in using the

"Delta-Star" connection for 4,000 volt distribution has been to ground the common point of the secondary transformer connection definitely, thus limiting the voltage of any part of the system to ground to a maximum of 2,300 volts. In this case an accidental ground on the system immediately becomes a short circuit, with 2,300 volts across it, and the current which the circuit breaker is called upon to open will be limited only by the impedance of that portion of the power line and ground circuit actually involved.

In practically every instance, a 4,000 volt distribution system is installed with a fourth conductor as a ground conductor, in order to avoid high resistance earth return circuits and interference with other electrical systems as well as hazard to the public. Therefore the impedance will generally be quite low and the possible "line to ground" short circuit current will be comparable to the "line to line" short circuit current of the 2,300 volt "Delta-Delta" systems.

Currents of 500 amperes or more are quite probable, and may possibly reach 1,000 amperes in the larger systems, or if the breakdown occurs not far from the transformer substation. With short circuit currents of such magnitude, the resistance from shovel frame to ground would have to be very low if a dangerous voltage is to be avoided.

The entire portion of the distribution system which extends from the permanent overhead pole line to the shovels, involving the short cable taps from the lines to the switch houses, the switch houses themselves, the power cables and the shovels, must be regarded as potentially hazardous. Steps are now being taken to minimize this hazard.

Of first importance is a good ground connection of ample conductivity and low resistance, together with a "system ground" of permanent low resistance. A few system grounds have been developed with as low as $\frac{1}{2}$ ohm resistance, but probably most of them will be found to be between 1 and 3 ohms. Five ohms would be considered unsatisfactory, but in a few cases it might not be practical to improve this value.

The ground connection from the shovel frame to the system ground is a matter of cable design and manufacture, plus proper handling of the cable in service and tests at necessary intervals. The recent investigation of shovel cables showed that in many cases the resistance of the ground circuit in the cable itself was gradually increasing through wear and breakage of individual wires in the ground sheath, through corrosion of the sheath wires on account of excess sulphur in the rubber-filled tapes used in the cable construction, and because of the entrance of soil acids through injuries in the cable jackets.

It was not until recently, by testing with low-reading instruments, that the corrosion problem became evident, because the ordinary circuit testing instruments showed a continuous ground circuit in practically all cases. Changes in cable design have been made by the man-

ufacturers, and the former difficulties have been largely eliminated in cables now obtainable. Knowing the value of the "system ground" resistance at any property, a test of the resistance from shovel frame to ground will quickly indicate the condition of the ground circuit in the cable, and what we are interested in primarily is low resistance from shovel frame to ground.

Of almost equal importance is some method of limiting the amount of current which can flow in the circuit during a "line to ground" fault, so that the voltage drop across an accidental ground connection can be kept low enough to avoid the hazard of dangerous or fatal shocks. An obvious way to accomplish this is to insert a definite impedance in the ground circuit at a safe location, so that practically the total voltage from line to ground can be used up in forcing the "ground fault" current through this device, thus leaving only a very small fraction of the voltage available for accidental ground contacts. This is very easily accomplished in the case of the 4,000 volt grounded "Delta-Star" systems by simply inserting this "current limiting reactor" in the common neutral circuit at the transformer station, so that the secondary system is grounded through this reactor rather than connected directly to ground.

In the case of the 2,300 volt "Delta-Delta" ungrounded systems, where there is normally no definite point of contact between line and ground, the occurrence of an accidental "line to ground" fault would not in itself cause any special hazard or interference with operations. However, if such an accidental ground already existed in some other part of the system, as for instance in the winding of a compressor or pump motor, and a second breakdown should occur in the shovel cable or on the shovel itself, the second "line to ground" fault would most likely occur in a different phase, and thus cause a short circuit of the entire system voltage.

Therefore, it is necessary to protect against a condition of accidental ground even in the ungrounded "Delta-Delta" systems. It is possible to connect a set of potential transformers in such a way that if an accidental ground occurs, a relay can be operated to give a warning or open a circuit breaker. However, the only indication of an accidental ground on this type of system would be unbalanced voltages, which would occur simultaneously over all parts of the system; thus there would be no means of knowing where the ground fault actually occurred.

In small properties, with only one or two shovels in operation, this type of protection might be sufficient, and the relay could be connected to trip out the main circuit breaker, which would remain open until the location of the ground could be determined by test and repairs made. However, there might be mill operations or pumping going on, in which an accidental power shut-down might result in considerable delay or even danger to the property. In these cases, recognizing the fact that the shovel cable system is the

most hazardous part of the entire distribution system, the shovel feeder circuit breaker could be tripped out on accidental ground, leaving the rest of the system operating.

A supplementary visible or audible signal could be arranged to show whether the opening of this breaker had "cleared" the ground from the rest of the system. If not, the system could be sectionalized manually by the various feeder breakers to determine the portion of the system in which the ground fault occurred, and the breakdown repaired or temporarily disconnected from the system in order to resume shovel operations.

In the larger mines, where several shovels are in operation, and where power is supplied from a 2,300 volt "Delta-Delta" system, special equipment is necessary for selective operation of the various shovel feeder circuit breakers to avoid shutting down shovels unnecessarily. In these cases an external ground connection is required, and this is generally accomplished by the use of a special three-phase grounding transformer connected to the three lines, and with a common terminal connected to ground. These transformers are so designed that the current they draw from the line is kept to a very low value, and yet if one line should become accidentally grounded, the ground fault current can be limited to a definite maximum. In both the 4,000 volt "Delta-Star" systems with current limiting reactors, and the 2,300 volt "Delta-Delta" systems with grounding transformers, a "line-to-ground" fault any place in the system results in a limited short circuit between the affected line and the point of common connection.

Therefore there is an actual current unbalance in the affected portion which can be detected by properly connected current transformers and relays, and the faulty feeder can be instantly disconnected from the system without disturbing the other feeders connected to the same substation. The current limiting reactors and grounding transformers now being used in this district are designed to limit the maximum current that can possibly flow through the ground, in case of a "line-to-ground" fault, to not over 50 amperes. Therefore, if we are able to maintain a ground resistance of, say, 3 ohms at the shovel, the maximum accidental voltage from shovel frame to ground can not possibly exceed 150 volts, and would actually be somewhat less than this on account of circuit and ground contact resistance.

The application of this system of protection is simply a matter of working out details, and the exact method to be employed is probably a question of local conditions and the individual judgment of the engineer in charge. There are a few points, however, which should be taken into consideration.

In case a limited grounded system with selective tripping is chosen for a given property, care must be taken that the system is grounded only at the point of common connection, and that the high voltage neutral points of distribution

transformers connected "Star-Delta" from 4,000 volt systems should be completely insulated from ground. Also, if two or more properties obtain power from a common transformer bank, and either or all properties decide on selective tripping, only one grounding transformer or reactor should be installed on the entire system, in order to avoid parallel ground paths and the possibility of increased ground fault current. These grounding transformers and current limiting reactors do not have thermal capacity to carry ground current continuously, and therefore arrangements must be made so that they can be disconnected from the system after a short interval, in case a ground fault occurs which cannot be removed by the opening of a feeder circuit breaker.

This could be done in the case of a grounding transformer on a 2,300 volt system, by protecting the transformer with a circuit breaker with time delay trip, so as to disconnect it from the line after a definite interval. The same thing could be done for either the grounding transformer or the reactor by inserting a single pole circuit breaker in the ground connection, to isolate the system from ground after a similar interval. In either of these cases the system would continue to operate as an ungrounded system, accidentally grounded on one side, and the other two lines would be raised to full system voltage above ground. In the case of 4,000 volt systems, proper conductor insulation and protective gap settings become important.

In case selective tripping is chosen for any property, a continuous copper ground system should be installed, available from any shovel location, and connected to the common grounding point for the reactor or grounding transformer. A grounding transformer can be installed at any convenient point in a "Delta-Delta" system, but a current limiting reactor on a 4,000 volt "Delta-Star" system should be installed only at the common transformer connection at the substation, in order to avoid the possibility of an accidental ground at some point between the transformers and the reactor itself, which would render it ineffective. (Presented to the National Safety Council.)

Mine Safety Conference

A two-day conference on mine safety under the auspices of the Lake Superior Section of the National Safety Council will be held at Duluth, Minn., June 24 and 25. Attendance is estimated to reach 250 representatives who will represent approximately 15,000 miners from this district. The conference is the first of its kind to be held in this district. An exhibit of safety equipment by national manufacturers and companies will be shown.

The Mining Society of Nova Scotia has extended an invitation to the officers and members of the American Mining Congress to attend the semi-centennial meeting of the Society to be held in Halifax, June 21 to June 23, 1937. S. C. Mifflin is secretary of the Association.

Canada's Largest Electric Hoist

By ALEX J. NICHT, JR.*

THE International Nickel Company, the world's foremost producer of nickel, has just installed at its Creighton mine near Sudbury, Ontario, the largest electric-driven hoist in Canada.

The mechanical parts of this hoist occupy a floor space of 65 ft. 4 in. long by 47 ft. 7 in. wide, and the total weight of the unit is approximately 1,200,000 lbs. These figures give a general idea of the huge size of this hoist. Its general appearance is shown by the illustration herewith.

The hoist drums are of the bi-cylindro-conical type 12 ft. 0 in. diameter at the small end and 25 ft. 0 in. diameter at the large end. They are mounted tandem, each drum on its own shaft and the two shafts connected by a train of gears. Pinion shafts are mounted at either end of the train which in turn are coupled to 1,200 hp. 400 r.p.m. direct current motors receiving power from a synchronous motor generator set. The control is of the variable voltage type sometimes referred to as Ward-Leonard control whereby the speed of hoist is governed by varying the current in the fields of the generators of the set while the direction of rotation is changed by reversing the current in the field. All the operations are accomplished through magnetic contactors on the control panel operating in fixed sequence.

The hoist is designed to raise a net ore load of 18,000 lbs. per trip in skips weighing 10,000 lbs. each and operating in balance in a vertical shaft. The hoist is designed for a maximum output of 250 tons per hour and for a top rope speed of 3,000 ft. per minute. Each of the two drums has a capacity of 4,513 ft. in one layer of 1½-in. hoisting rope, 6 by 19 construction, weighing 5.5 lbs. per ft.

Rugged welded steel sole plates support all the main bearings. These sole plates are of the inverted "U" type with wide flanges on the bottom to give ample bearing surface on the foundations, and surround the gear train bearings on one

side and support the drum shaft bearings on the opposite side.

Drum shaft bearings at either end of the drums are 24 in. diameter by 40 in. long. Drum shaft outboard bearings at gear ends are 20 in. diameter by 32 in. long. Idler gear shaft bearings are 16 in. diameter by 27 in. long. The two sets of pinion shaft bearings are 12 in. diameter by 28 in. long. The bearings are provided with top and bottom removable spherical seated shells. The pinion shaft bearings are ring lubricated while all the other bearings, in order to establish and maintain oil film for ease of starting, are oil lubricated under 500 lbs. per square inch pressure from duplicate pressure pumping units located on the floor of the pit at the loose drum side, with individual regulation for each bearing. The oil from the bearings returns by gravity flow to a 70 gal. oil filter and cooler from which it is again pumped to the bearings.

The two drum shafts are each 30 in. diameter through the drums and are smooth hollow bored and periscope inspected, each shaft being 36 ft. 0 in. long and weighing approximately 70,000 lbs. finished. These shafts are 3¼ to 3% percent nickel steel forgings, free from seams, ghost lines or flaws of any kind, and after final heat treatment were required to be free, at 100 magnifications, from primary crystallization or dendritic microstructure. Physical tests show an ultimate tensile strength of over 90,000 lbs. per square inch, and an elastic limit of 57,700 pounds per square inch, elongation 25 percent in 2 in. and a reduction in area of 47 percent.

The spiders of the tight drum and the gears are keyed to their respective shafts by two tangential keys each in two parts.

As mentioned earlier, the drums are of the bi-cylindro-conical type, having a 12 ft. 0 in. diameter cylindrical section joined to a conical section tapering from 12 ft. 0 in. diameter to 25 ft. 0 in. diameter, which end in turn is joined to a 25 ft. 0 in. diameter cylindrical section. The forward drum, that is the one to-

wards the head frame, is keyed to its shaft, and carries the underwound rope, while the back drum is clutched and carries the overwound rope. This latter drum is driven by a positive cast steel multi-tooth dental type clutch actuated by an oil operated clutch engine.

The drum shells, on account of their size, are made in a large number of sections and bolted together. Special attention and study was given to the design of the longitudinal joints to secure a construction eliminating as far as possible danger of cracking of the shells under rope tension. Each drum shell is spiral grooved for 1½-in. rope, holding the entire length of rope in a single layer.

The drum shells are made of high-test nickel alloy castings having the following approximate composition:

Total carbon	2.70 — 3.00%
Manganese	— .80%
Silicon	— 1.75%
Nickel	1.25 — 1.50%

The average tensile strength of these castings is 52,500 lbs. per square inch; transverse strength, 12 in. between centers, is 4,955 lbs. per square inch; Brinell hardness 196 to 217. The tensile and transverse strength were found to run consistently in the ratio of around 10½:1. The high compressive strength of this nickel alloy casting played an important part in its selection for this installation. Tests consistently show more than 160,000 lbs. per square inch in compression.

Each complete drum shell is supported at either end by a cast steel spider of special design to secure correct transfer of the loads from the shell to the shaft. One complete drum weighs approximately 242,000 pounds. The two drums operate in conjunction with each other, the one hoisting, the other lowering. The upcoming load starts on the small diameter of the drum.

Each drum is served by a 15-ft. 0-in. diameter 21-in. face parallel motion welded structural steel post brake designed to give uniform release of the brake blocks at all points, while anything happening to the brake-operating mechanism will apply the brake. Basswood brake blocks are held to the post by a construction permitting easy replacement without disturbing the brake

* Engineer, Hoisting Department, Allis-Chalmers Manufacturing Co.

set-up; the blocks have a total contact area of 50 percent of the brake wheel surface, resulting in low brake pressure at the rubbing speed encountered. The pins are of the shouldered type with locked castollated nuts for safety, and all points requiring lubrication are provided with Zerk Industrial fittings.

An oil-operated brake engine of the gravity type is used to manipulate each brake, designed to raise the weights by oil pressure controlled by a balanced piston valve. The brake is applied by relieving the pressure on the underside of the piston, provision being made in the design so that the movement of the piston corresponds exactly to the movement of the operator's hand lever, and in this way any amount of braking from 0 to full amount can be applied, maintained, and controlled as desired. In case of failure of the oil pressure, the brakes apply automatically by gravity, the intensity and speed of application being under graduated control, depending on the speed at which the hoist is running at the time of the emergency application as well as the position of the skips in the shaft.

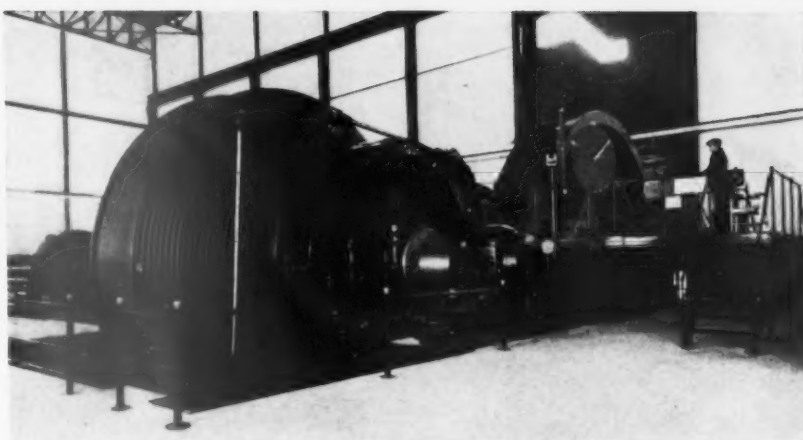
The brake engines are equipped with emergency solenoid operated valves, which also apply the brake under graduated control in case of failure of power, overspeed, or overwinding, functioning in conjunction with type "C" Lilly safety controllers on the hoist.

The gears and pinions are of the Sykes continuous herringbone cut tooth type, consisting of one main gear on each drum shaft with an idler gear between the two tying them together and two pinions, one meshing with each drum gear. All three gears are of the same size, 144-in. PD., 2 DP., 30-in. face 288 teeth, made of special cast steel, and are in halves with binding fit on the shafts. All gears are keyed to their respective shafts by two tangential keys each and provision is made in the design of the mounting of the idler gear shaft permitting adjustment to compensate for any wear. Each pinion has 27 teeth and is forged integral with its shaft, which in turn has a half-flanged coupling forged integral at its outer end to bolt to a companion flange forged on the shaft of the driving motor. The gear ratio gives a drum speed of 38.2 r.p.m. when the pinion shafts are driven at 400 r.p.m.

The entire gear train is totally enclosed in a gear case in order to run the gears in a suitable lubricant. It is sectionalized for removal of the pinion shafts without disturbing the whole top of the casing, and is provided with horizontal inspection door over each pinion, also with a door for inspecting the idler gear engagement.

The operator's platform is located on the drum side of the hoist, which brings its mounting at right angles to the rope lead.

The dial indicators, which are gear driven from the drum hubs, are placed directly in front of the platform. On the platform, conveniently grouped, are



Canada's Largest Electric Hoist

the operating levers, of which there are four. From left to right these are the clutch lever, loose drum brake lever, master controller lever, and the keyed drum brake lever. The clutch lever and loose drum brake lever are mechanically interlocked by means of cam-shaped discs, which compels the operator to have the brake on the loose drum set before the clutch can be disengaged, and likewise it is impossible to release the brake unless the clutch is in the full engaged position. This positive interlocking prevents the loose drum getting out of control of the operator. All operating shafts and Lilly safety control drive shafts are carried in anti-friction bearings to insure ease of operation.

This giant hoist is fully protected by safety devices against overwinding, overspeeding, failure of power while hoisting. The operator is compelled to slow down properly when approaching the landing, but in the event that the hoist is stopped due to any of the above emergencies the brakes are automatically applied with proper rapidity but without

undue shock. In case of an overwind it is impossible for the operator to start the hoist again in the same direction.

The oil for operation of the clutch and brake engines is supplied by an oil pressure system. This consists of an oil storage tank, a pressure tank, and duplicate motor-driven rotary gear pumps with suitable control, all built as a unit. This pressure system can deliver the required quantity of oil up to 200 lbs. per square inch pressure for the fast operation of the brakes and clutch with one pump running, the second being a reserve. It is the safest and simplest means of producing oil under pressure, also no stuffing boxes or valves are used so that maintenance is practically eliminated. This type has generally superseded the weighted accumulator.

The mechanical part of this hoist was designed by Allis-Chalmers Manufacturing Company at Milwaukee and was built from their drawings by Canadian Allis-Chalmers, Limited, at their Rockfield works, Quebec, and erected under their supervision.

The governor of Idaho has appointed the Idaho Copper Tariff Board. This board will cooperate with other western copper producing states in matters relating to import duties on copper. Members of the committee include: H. L. Day, of the Hercules Mining Company; Stanly A. Easton, Bunker Hill and Sullivan Mining and Conc. Co.; Frank Eichelberg, Callahan Lead-Zinc Company; Ross D. Leisk, Sunshine Mining Co.; J. F. McCarthy, Hecla Mining Company; E. T. Fisher, of Warren, Idaho; and G. W. Gwinn, of Boise.

Bituminous Coal Commission Ruling

Bituminous Coal Commission has named 19 acting secretaries who will conduct elections in the 19 districts for board memberships between June 21 and 25. Acting secretaries in the

districts they will serve are as follows:

District No. 1, W. A. Jones, Central Pennsylvania Coal Producers Assn.; 2, B. H. Cannon, Pittsburgh, Pa.; 3, D. T. Buckley, New England Coal & Coke Co.; 4, Ezra Van Horn, Cleveland, Ohio; 5, Frank Heath, Bay City, Mich.; 6, G. A. Blackford, Wheeling, W. Va.; 7, P. M. Snyder, Mt. Hope, W. Va.; 8, E. C. Mahan, Southern Coal & Coke Co., Knoxville, Tenn.; 9, Brent Hart, Hart Coal Corp., Madisonville, Ky.; 10, J. R. Henderson, Illinois Coal Operators Assn., Chicago, Ill.; 11, Jonas Waffle, Terre Haute, Ind.; 12, M. G. Youngquist, Des Moines, Iowa; 13, Jas. L. Davidson, Birmingham, Ala.; 14, S. A. Bramblett, Fort Smith, Ark.; 15, W. E. Blucher, Kansas City, Mo.; 16, M. W. Mitchell, Cheyenne, Wyo.; 17, B. P. Manley, Salt Lake City, Utah; 18, M. F. Purcell, Montana Coal Operators Assn., Billings, Mont.; 19, D. S. Hanley, Seattle, Wash.



The Annual Banquet, George B. Harrington, Toastmaster

IN COMMENTING upon the 1936 convention and exposition in our June issue of that year we said: "The committee set out to surpass all previous records and hang up new records for future meetings to shoot at." The 1937 convention and exposition outdistanced the previous year's record by many points. The attendance was greater, there were a larger number of exhibits, and the enthusiasm was correspondingly increased. The program was interesting and arranged to cover a large number of problems of special interest at this time. The papers were presented under the direction of the Floor Committee with the greatest efficiency and time economy.

The attendance broke all previous records with a registration of approximately 5,000 persons. The growth of these conventions is evidenced by the record of attendance over the period of their history, which is as follows:

Year	Attendance	No. of Coal Companies	No. Exhibitors
1926	1,523	323	93
1927	1,246	402	118
1928	1,620	353	98
1929	2,062	414	113
1930	2,830	365	127
1931	2,435	435	124
1932	1,342	243	74
1933	3,480	451	78
1934	2,287	431	96
1935	3,023	508	125
1936	3,889	602	133
1937	4,777	716	151

AN EPOCHAL EVENT

To C. E. Cowan, and his committee, the most sincere commendation of the industry is extended for the splendid achievement of the 1937 meeting.

The convention opened informally Sunday afternoon with a reception in honor of Mr. Cowan, and the Program Committee, which was attended by officials of the American Mining Congress, members of the Program Committee and members of the Manufacturers' Division of the organization. The convention officially opened on Monday, May 17, and continued to Thursday afternoon, May 20. The exhibit closed Friday, May 21, at 1 o'clock, the morning being devoted to "Exhibitors' Day" when operators who had not had an opportunity to inspect the exhibits were given an uninterrupted period for such inspection.

Aside from the business sessions, the Committee on Arrangements presented entertainment each evening which was an outstanding feature of the convention. W. W. Dartnell served as chairman of the Arrangements Committee. W. D. Turnbull, Westinghouse Electric and Manufacturing Company, served as chairman of the Entertainment Section. Newell G. Alford, consulting engineer of Pittsburgh, and Wilmer H. Cordes,

American Steel and Wire Company, were the official chairmen who saw to it that each delegate was properly welcomed and that full information on all events was in their hands. John C. Cosgrove, West Virginia Coal and Coke Corporation, and John Coakley, Thomas A. Edison, Inc., with their committee members, which represented each district, were responsible for the remarkable and satisfying attendance record. H. B. Husband, C & O Rwy. Company, who served as chairman of the Floor Committee, was responsible for the efficiency in handling the sessions. W. W. Rodgers, Westinghouse Electric and Manufacturing Company, served as chairman of the general Publicity Committee, and if any operator failed to learn about the convention it was no fault of the committee.

Julian D. Conover, secretary of the American Mining Congress, opened the session on Monday, May 17, at 10 a. m. He briefly welcomed delegates to the convention and outlined the work that had been accomplished by the organization since last year's meeting, with particular reference to the Coal Operators Committees of whose work this convention is the yearly culmination. E. J. Newbaker, vice president of the Berwind



White Coal Mining Company, presided at the opening session, presenting C. E. Cowan, chairman, Program Committee, and Bruce G. Shotton, chairman, Manufacturers Division, each of whom expressed their appreciation of the cooperation that had been given to them in the

development of the convention. The first paper on the program was *Streamlining Mine Ventilation*, by H. Landsberg, Geophysics Laboratory, Pennsylvania State College, who was unable to be present. The paper was presented by Dr. W. R. Chedsey, and outlined recent problems in aerodynamics and showed



H. Landsberg

that they can be used advantageously in meeting mine ventilation problems. A. Lee Barrett, Pittsburgh Coal Company, discussed Dr. Landsberg's paper, stating that ventilating costs may be reduced if attention is given to streamlining, providing the more fundamental rules are applied. C. S. Blair, vice president of the Black Diamond Coal Company, Alabama, presented a paper on *Barrier Pillars to be Left in Mine*. His paper covered state laws, thickness of cover, thickness and physical character of coal seam, permeability of strata, degree of exhaustion of coal barrier, limit of area in mine surveys, and practical examples of barrier pillar practice. I. W. Miller, Tennessee Coal, Iron and RR Co., discussed Mr. Blair's paper, presenting

factors affecting practical width of barrier pillars to be left in mine under below drainage conditions, which will assure adequate protection of active workings against impounded water. M. L. Coulter, chief engineer, Clearfield Bituminous Coal Corporation, also discussed Mr. Blair's paper, stressing adequacy of barriers to afford safety, with a review of barrier pillar legislation, with special reference to the findings and recommendations of the Pennsylvania Commission. John M. Humphrey, Jr., engineer, Lehigh Valley Coal Co., discussed *Flood Conditions of 1936 as They Affected Mining in the Anthracite Field*. He briefly stated that "Precautions are necessary to safeguard mining operations against flood periods. This is an engineering problem with respect to the character of wash overlying the outcrops of the various veins. A study should be made of adjacent mines with respect to conditions of all barrier pillars and the subsidence of the surface." *Cutting Requirements for Conveyor Mining* was presented by J. O. Cree, West Virginia Engineering Co. This paper appears in full in this issue of THE MINING CONGRESS JOURNAL. Briefly, however, Mr. Cree, presented methods of mining machinery operation in connection with conveyors; the amount of power necessary for mining machines;



Ivan W. Miller

the human element in the operation and maintenance of machines.

Six papers were presented at the Monday afternoon session. C. A. Gibbons, Susquehanna Collieries Company, presided as chairman. *Advantages of Sectionalizing Power by Use of Automatic Circuit Breakers* was presented by John T. Parker, superintendent of the Inland Steel Company, who

pointed out that proper use of automatic circuit breakers are a protection against serious and widespread power failures in the mines; they also are a protection against fire hazards, resulting from grounded power lines and against abuse of equipment by overloading. *Communication Systems in Mines* was presented by W. C. Thompson, the New River Co. This paper appears in full in this issue and



John T. Parker

presents personal observations during the past 25 years in mines in the southern field. A. C. Watts, general superintendent, Utah Fuel Co., prepared a paper on the use of *Battery Locomotives in Thick Pitching Seams* which, in his absence, was presented by L. D. La-



W. C. Thompson

mont, mining and mechanical engineer, Philadelphia and Reading Coal and Iron Company. The paper presented a non-technical description of the use of permissible storage battery locomotives for gathering purposes in a thick pitching bed of coal, which has dust and gas conditions, making safety the main factor in determining equipment. *Improved Rubber Tired Mine Haulage* was presented by J. H. Fletcher of the Bluebird Coal Co. This paper appears in full in this issue and presents a new method of transportation. Rubber-tired gathering haulage equipment serves mechanical haulage eliminating room tracks. A paper was scheduled to appear on the *Effect of Illumination on Production* by L. E.



Thos. C. Cheasley

Adams, Spring Canyon Coal Company, but at the last minute Mr. Adams was unable to prepare the paper. Thomas C. Cheasley, Sinclair Coal Company, presented a paper on *Waxolized Treatment for Coal* which briefly outlined this process and presented the results obtained through its use. Paul E. Edeburn, chemist and preparation manager for Butler Cons. Coal Co., presented a discussion of Mr. Cheasley's paper which dealt with paraffine waxes as surface coatings and dust preventing agents for coal. He stated that the efficiency in using the wax is estimated roughly from 67 to 70 percent and that the processes are as yet experimental.

There were six main topics presented to the Tuesday morning, May 18, session, with Wesley Harris, Bicknell Coal Co., presiding as chairman. The opening paper was the *Effect of Mechanical vs. Hand Loading on Degradation of Coal* presented by J. G. Crawford, general manager, Valier Coal Co. In summing up his paper Mr. Crawford said: "Every mine is a problem in itself, and careful study must be made to determine the most suitable preparation plant to size and clean coal, always bearing in mind, that the object is to increase the margin of net profit." *New and Practical Method of Working a 20-in. Seam of Coal* was presented by Guy E. Lipe, general superintendent of the Dixie



Thos. A. Stroup

Fuel Company, which described mechanical mining of a vein of clean coal averaging 20 in. in thickness. *Face Preparation for Mechanical Loading* was presented by T. A. Stroup, chief engineer, West Virginia Coal & Coke Corp. His paper discussed the methods used in removing a persistent parting of shale bone and rash from a seam of coal prepara-

tory for mechanical loading. It also described methods of drilling and shooting. A discussion of this paper dealing with "Effect of Type of Bit and Bit Lacing on Bug Dust Sizes" was presented by F. F. Jorgensen, Consolidation Coal Company. J. J. Forbes, supervising engineer, Bureau of Mines Experiment Station, presented an interesting paper on *Advanced Mine Rescue Training Courses* which presented some of the fundamental facts regarding safe procedure at time of mine fire or explosions. Two papers were presented on *Mercury Arc Rectifiers for Coal Mining Service*. The first by A. L. Lee, consulting engineer, Pittsburgh, Pa., which discussed the relative merits of mercury arc rectifiers, synchronous converters and motor generator equipment, and presented information on the first installation of an Ignitron rectifier for mining service. A. Lee Barrett, Pittsburgh Coal Co., in discussing the same subject said that the mercury arc rectifier, together with its offspring, the Ignitron, presents a key to a new era. He pointed out that the new substitution will have a cubical content of 15 percent, and installation cost of one-third and a relocation cost of one-fifth of the usual station and may be relocated in two days. *Mining Systems for Extract-*



A. L. Lee



J. J. Forbes

ing Pillars was presented by H. L. Griffin, division engineer for the Koppers Coal Co., which gave a comparison of pillar recovery methods in the Pittsburgh seam. It also gave various observations regarding subsidence. R. L. Adams, general superintendent of the Old Ben Coal Corp., prepared a paper as a discussion but was unable to be present to present it. His paper briefly stated that: "Break lines are difficult to maintain. Best results are obtained from cross cutting and slabbing pillars as conditions warrant." Working long faces retreating he held to be only partially successful.



R. L. Adams

Chas. F. Hamilton, vice president, Binkley Coal Co., was chairman of the Tuesday afternoon session when five major topics were presented. The first paper dealt with *Shearing As An Aid to Mechanical Loading*. F. Earle Snarr, Chicago, Wilmington and Franklin Coal Co., in presenting the paper said: "Shearing creates an additional free face, which permits cheaper and better shooting and produces a larger percentage of domestic sizes that are less powder shattered. It increases loader capacities while reducing production and maintenance costs. It promotes safety by leaving more solid tops and ribs." W. H. Lesser, Pierce Management, pre-



A. Lee Barrett



North Hall



F. Earle Snarr

sented a paper dealing with *Preparation Problems in the Anthracite Field* which gave trends in cleaning anthracite since the industry started, together with a brief description of the processes necessary to meet an exacting consumer demand with a quality product. Results from

Operation of a Mine Power Plant was presented by C. M. Garland, consulting engineer. His paper presented some of the advantages and disadvantages of waste fuel and gave operating costs, discussing labor and other problems. Ray Baughman, Central Indiana Coal Co., presented a paper on *Cleaning Strip Mine Coal* dealing with the Little John plant of his company. *Track Mounted Cutting Machines with Mobile Loaders* was presented by P. D. Everly, superintendent of the Island Creek Coal Co., and Walter F. Clarke, general superintendent of the Independent Coal & Coke Co. These papers pointed out that higher labor efficiency was obtained with track mounted cutting machines, which also gave greater realization, safer working conditions, and a substantial explosives



Ray Baughman

savings. Results obtained in the Rocky Mountain area and an unusual experiment in the employing of these machines in development work was brought out in the discussion.

Carl T. Hayden, vice president and general manager of the Sahara Coal Co., served as chairman of the Wednesday



P. D. Everly

morning session. The first paper presented *Mechanical Loading on Conveyors*. The main paper was presented by John C. Lowry, Jr., assistant manager of mines, West Virginia Coal & Coke

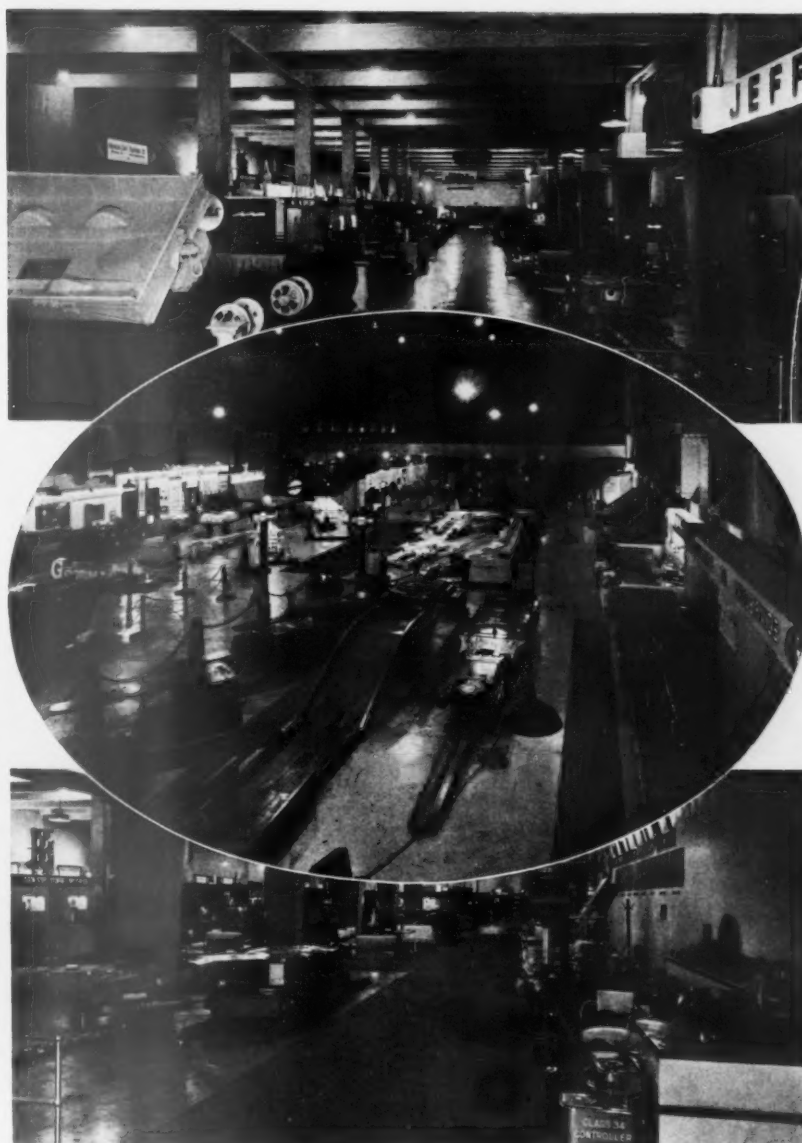


John C. Lowry, Jr.

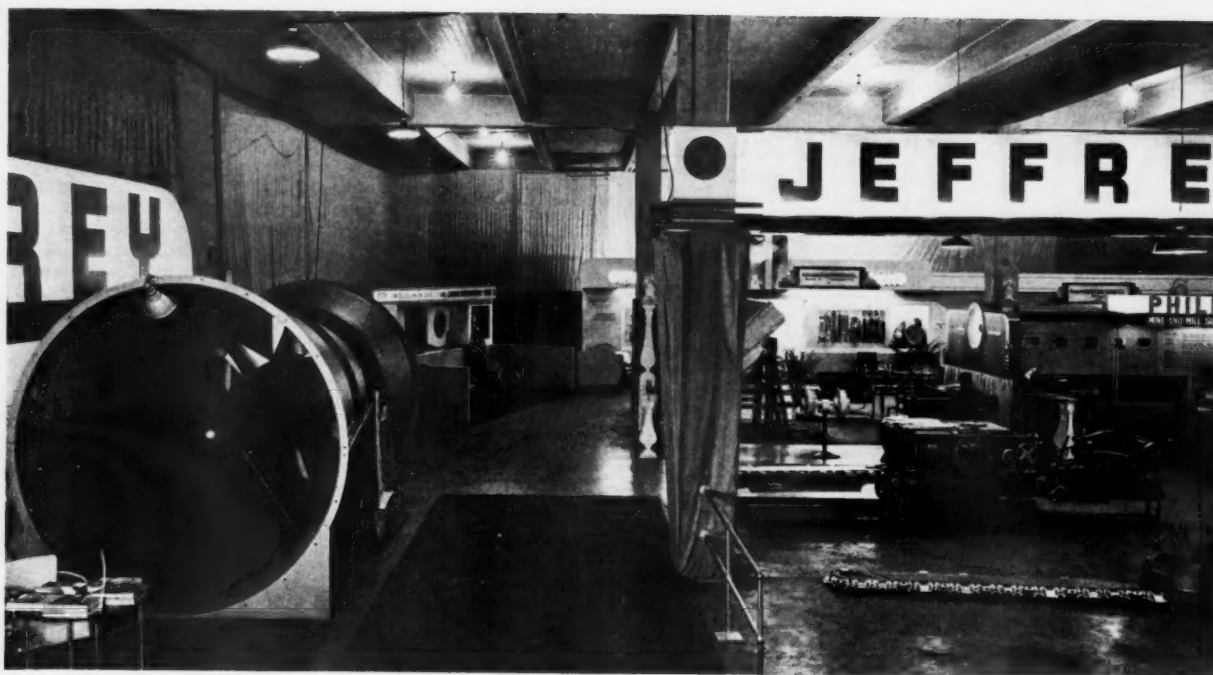
Corp., outlined briefly the original plans, troubles and changes in the installation of conveyor loading at this property. Earl J. Jones, of Zanesville, Ohio, participated in the discussion of this subject with a description of his property which presents complete mechanical

operation from face to tipple, with loading machines, underground conveyors, together with truck movement of output to river for barge hauling to destination. T. E. Jenkins, president of the National Fuel Company, prepared a paper on *Experience with Conveyors in Thin Seams Overlaid with Bad Roof in the Colorado District*. In his absence the paper was read by C. E. McWhorter, Goodman Manufacturing Co. *Bringing Safety Home to the Miner* was presented by Dan Harrington, U. S. Bureau of Mines, who stressed again the statement that safety in mining rests on the shoulders of management. His paper gave numerous suggestions for accident prevention and securing cooperation of workers. Otto Herres, vice president of the U. S. Fuel Co., prepared a paper

Mine Accidents and Their Effect on Production and Production Costs. This paper was read by P. D. McMurrer, due to Mr. Herres' inability to be present. This paper briefly stated that "Accident rates and production costs move in the same direction. Losses may be hidden. Examples show heavy losses and a wide opportunity to improve production costs by eliminating accidents." *Coal Preparation in Alabama* was presented by B. W. Gandrud of the U. S. Bureau of Mines. This paper was a review of coal preparation in this field. Bruce Payne, president, Payne Coal Co., presented a paper on *An Approach to the Problem of Anthracite Merchandising* in which he pointed out that anthracite has missed its great opportunity by reason of its failure to concentrate on heating of dwellings and small apartments. It presented recommendations for offering the



General Views of Exhibits in South and North Halls



Jeffrey Manufacturing Co., Which Received Third Honor Place for Best Exhibit



B. W. Gandrud



Bruce Payne

home owner a heating service such as would be offered by a public utility. *Transportation by Underground Conveyors and Aero Tram* was presented by R. A. Suppes, superintendent of the Brule Smokeless Coal Co. This paper was largely a motion picture presented in cooperation with the Jeffrey Mfg. Co., which showed complete mechanization with chain room and face conveyors, main and butt entry belt conveyors, and aero tram.

L. C. Campbell, assistant to vice president, Koppers Coal Co., presided at the Wednesday af-

ternoon session. The first subject on the program, *Modern Mine Drainage*, was presented by A. B. Kelley, general manager, Humphreys Coal & Coke Co., and E. B. Wagner, electrical engineer, Lehigh Valley Coal Co. Mr. Kelley presented a paper on *Dewatering of Abandoned*



A. B. Kelley



Carel Robinson

Mines by deep well turbine pumps. The process is new and in this instance proved efficient. Mr. Wagner presented Automatic Control of Large Mine Pumps, and gave experiences with automatic control of equipment. Securing Teamwork Between

Management and Labor was presented by Carel Robinson, manager of mines, Kelley's Creek Colliery Co., when he presented some observations on today's industrial problems. A symposium on *Mining Extension Courses* was presented by C. E.



C. E. Lawall



Goodman Manufacturing Company



Lawall, School of Mines, West Virginia University; H. G. Nold, Ohio State University; and H. B. Northrup, Pennsylvania State College. They briefly presented the courses offered by



TROPHY WINNER



Display of the
Sullivan Machinery
Company, Winner of
the 1937 Award for
Best Exhibit

Link-Belt
Company, Taking
Second Honors



JUNE, 1937

Committee Chairmen



W. W. Dartnell

General Chairman of the Committee on Arrangements who rendered untiring and helpful service which is, in large part, responsible for the results obtained at the convention.



**Newell G. Alford
Wilmer H. Cordes**

Chairmen of the Welcoming Committee, who sent delegates home with the feeling that the meeting was well worth while.



**John Coakley
John C. Cosgrove**

Chairmen of the Attendance Committee, who convinced approximately 5,000 men that they should attend this meeting.



W. W. Rodgers

Chairman of the Publicity Committee. A talented and energetic member of the Fourth Estate who so adequately informed the industry concerning this year's meeting.



H. E. Nold

presented Long Face Mining; Edward Fox, superintendent, Madeira Hill and Co., who presented Single Units; B. F. Reed, Turner Elkhorn Mining Co., who presented Multiple Units; and C. P. Brinton, Barnes and Tucker Co., who discussed Belt Conveyors.

George H. Rupp, Colorado Fuel and Iron Company, presided at the Thursday morning session, May 20. The first paper to be presented was by G. Stuart Jenkins, general superintendent of the Consolidated Coal Co., on *New Developments with Mechanical Loaders*. He pointed out that the most important phase in a mechanization program is to

these universities and the facilities offered to the mining industry through co-operation with their efforts. Another symposium of importance was that of *Hand Loading on Conveyors*, which was participated in by Eric George, superintendent, Koppers Coal Co., who



H. B. Northrup

secure a continuity of coal flow from the discharge of the loading machine. Among the newer innovations is the use of conveyors for handling the coal from the face and the adaption of rubber tired haulage as used in strip mines to underground mines. He pointed out that in this "trackless mine" it



C. P. Brinton

is surprising that a detailed cost sheet will indicate approximately 5 cents a ton including labor and material for track laying at mines not so equipped. Results from the earlier installations indicate an approximate increase of 30 percent in machine capacity or loading capacity. Such an increase in output or reduction in cost offers incentive for such development. *Definition of Load Demand, Load Factor, Power Factor, for Average Mine Manager—Effect on Power Costs*, was presented by M. W. Horgan, Monongahela West Penn Public Service Co. The paper clarifies the meaning of the words "Demand", "Load Factor" and "Power Factor." L. W. Bates, Appalachian Electric Power Co., presented an interesting discussion of Mr. Horgan's paper. *Safety Bonuses* was presented by J. J. Sellers, vice president of the Virginia Iron Coal and Coke Co., who said that such bonuses play an important part in

safety campaigns. C. A. Sine, safety engineer, Stonega Coke and Coal Co., presented the safety bonus program of his company. The Thursday morning session closed with a symposium on *Coal Cleaning*, which presented five discussions: *Methods and Performance of Drying Washed Coal* by T. W. Guy, consulting engineer, Charleston, W. Va., who presented a summary of investigations which covered methods and results of dewatering and drying washed coal at representative plants in the Appalachian and Central Bituminous Fields; *Heat Drying Plant at the Delta Washery*, by W. H. Price, Delta Coal Mining Company, which presented the dedusting treatment and drying of minus ¾-in. washed coal; *Use of Washing Tables for Preparing Coking Coal* was presented by Harry J. Hager, Alabama By-Products Corporation, who presented problems confronting by-product plants caused by impurities in the coking coal; *Oil Treatment*, M. H. Forester, Consolidation Coal Co., presented a paper on the use of oil as a dust proofing agent. He believed this process has proved itself an asset and that its flexibility of use indicates much merit in solving other problems; *Dedusting Methods* was presented by Henry F. Hebley, Commercial Testing and Engineering Co., who gave



W. H. Price

a review of the use of dedusters in the United States.

The final session of the convention, Thursday afternoon, May 20, was presided over by R. E. Salvati, general manager of Island Creek Coal Co. Paul Weir, consulting mining engineer, presented a paper on the *Future of Mechanical Mining*. He stated that "past experience and present development indicates the trend of future mechanization. Several manufacturers are now engaged in the design of a combination machine which will dig coal from the solid face and load it into



Henry J. Hager

mine cars or onto a conveyor, thereby eliminating the cutting, drilling, and shooting operation. Mine cars of a capacity up to 10 tons have been designed; * * * conveyors from face to preparation plant are being found economical under certain conditions. * * * Cutting machines which are capable of cutting



Henry F. Hebley

out and gobbing draw slate and bands in the coal vein in one operation, are certain to be improved in the future. * * *

The coal industry is definitely heading toward the use of a maximum amount of labor saving machinery and a minimum amount of labor." The convention closed with a splendid symposium on *Bituminous Coal Research*, led by John C. Cosgrove, president, Bituminous Coal Research, Inc., who presented the organization plan of this corporation for the bituminous coal industry, its progress, its results, its present work and its program for the future. His paper was followed by a discussion by Howard N. Eavenson, consulting mining engineer, who presented research in general and the value of research in creating new uses for coal; Ralph A. Sherman, Battelle Memorial Institute, presented the work being done at his institution and emphasized the necessity for domestic utilization of coal with particular reference to the residential stoker; A. W. Gauger, Pennsylvania State College, presented the work under way at this college on hydrogenation; H. C. Howard, Carnegie Institute of Technology, presented the work of the Institute, concerning the uses of bituminous coal and the chemical and physical changes it undergoes in such uses as carbonization, combustion, and hydrogenation; M. M. Leighton, Illinois Geological Survey, presented recent results from the Survey's program of research; J. E. Tobey, Appalachian Coals, Inc., discussed research as it applies to a sales program for coal.



C. E. COWAN

Vice President, J. H. Weaver & Co.

who served as Chairman of the Program Committee for the most outstanding convention ever developed by the American Mining Congress.



Howard N. Eavenson

The entire convention moved as a unit from the opening on Monday morning to the closing on Friday noon, and when the doors closed and the meeting was finally declared adjourned, those responsible for the development of the convention, were well rewarded for the effort put forth.

Highlights of the entertainment included Miss Jane Froman, radio, screen, and stage star, who received a tremendous ovation at the annual dinner; Ward Wilson, well known radio star, served throughout the entertainment features as master of ceremonies and established a new record for a smooth performance; Dorothy Byton's Debutantes added charm and variety; Joe E. Howard, famous for his many well known songs; Jackson Murray, head of the original Old Heidelberg Octette; and Walter Nilsson, a bicyclist of repute, added definite attraction to the entertainment features. One of the real highlights of the entertainment program was the California Varsity Eight, a group of boys formerly with Ziegfeld Follies, who presented feature entertainment each evening and won the highest praise of all the delegates. On Monday night, May 17, committee presented the Miners' National Amateur Hour, with the following participants: Island Creek Coal Company, Hanna Coal Company, Pittsburgh Coal Company, Tem-



Henry C. Howard

pleton Sherwood Coal Company, Consolidated Coal Company, and Koppers Coal Company, the Sit-Down Coal Company, and the Marvelous Trio. The contest was won by the quartet of colored boys presented by the Island Creek Coal Company. They received \$100 in cash and were heard on Tuesday, May 18, on a national radio hook-up. Through the courtesy of WLW, W. L. Kinnett served as one of the judges for the amateur contest. Other judges were Charles



Ralph A. Sherman



J. E. Tobey



Exhibits on Second Floor of Music Hall

West, manager of the California Varsity Eight, and Ward Wilson, National Broadcasting Company. Another feature of the entertainment was the Gay Nineties Night, which presented an old fashioned vaudeville show and the reincarnation of many of the Gay Nineties celebrities. The Lucky Shoes Contest, held on Wednesday evening, May 19, was won by Miss Original Pocahontas, sponsored by the Pocahontas Fuel Company, Inc. W. J. German, general manager of the company, was then elected to present Miss Cinderella with her slipper. Companies participating in the contest were: West Virginia Coal and Coke Corporation; Pocahontas Fuel Co., Inc.; Youghiogeny & Ohio Coal Co.; Lorain Coal & Dock Co.; Southeast Coal Co.; Binkley Coal Co.; W. J. Rainey, Inc.; Nellis Coal Corp.; Heisley Coal Co.; Consolidated Coal Co.; Dawson Daylight Coal Co.; Philadelphia and Reading Coal and Iron Co.; Pittsburg and Midway Coal Mining Co.; Pond Creek Coal Co.;

Consolidation Coal Co.; Koppers Coal Co.; Sinclair Coal Co.; and Appalachian Electric Power Co. The annual banquet on Thursday evening, May 20, was a delightful occasion and was of the usual speechless variety. George B. Harrington, president of the Chicago, Wilmington and Franklin Coal Company, was a distinguished and efficient toastmaster. The banquet hall was filled to overflowing with tables on the balconies and in the lobby.

Through the courtesy of the National Broadcasting Company and Frances Rockefeller King, head of the Private Entertainment Bureau of NBC, Station WEA, allotted 15 minutes to a nationwide hook-up on Tuesday, May 18. The program which cleared through the Crosley Radio Station at Cincinnati, Station WASI, presented Ward Wilson, Del Courtney's Orchestra, brief talks by C. E. Cowan and Julian D. Conover, the California Varsity Eight, the Miners Quartette of the Island Creek Coal Com-



The Mining Congress Journal Booth at the Exposition

THE MINING CONGRESS JOURNAL



W. D. Turnbull

who distinguished himself through the presentation of an entertainment program that compared favorably with a Broadway performance.

Amateurs

Winners, reading top to bottom, Island Creek Coal Co., Hanna Coal Co., and Consolidated Coal Co. Other participants, Koppers Coal Co., Pittsburgh Coal Co., and Templeton Sherwood Coal Co.

pany, and closed with Courtney's Orchestra.

In addressing the radio audience, Mr. Cowan said:

"Faced with keen competition from within and without and a constant demand for cheaper fuel of a good quality, the coal industry has, nevertheless, made rapid progress in recent years. Here in Cincinnati, this week, this great coal convention and exposition of the American Mining Congress offers a fine example of this fact. Thousands of progressive coal operators have congregated here to discuss ways and means of achieving greater efficiency and safety in mining the coal which provides the motive power for American industry and warmth for American homes."

He was followed by Mr. Conover, who said:

"This convention illustrates the ability of the coal mining industry to meet new conditions through improvement in methods of mining and processing its product. The magnitude of the mining industries is not generally appreciated. These industries employ over a million and a half workers and furnish a livelihood to almost 25 million of America's people. Coals' annual wage bill alone amounts to \$805,000,000. Coal forms the basis for some 500 American industries and furnishes our chief source of energy and power. It is the real backbone of our industrial civilization."

A meeting of the national Board of Directors of the American Mining Congress was held on Thursday, May 20, to which leading executives of coal mining companies were invited. H. I. Young, president of the American Mining Congress and of the American Zinc, Lead and Smelting Company, presided at the meeting. Reports were made by E. V. Daveler, chairman of the Finance and Budget Committee; Herbert Wilson Smith, chairman of the Social Security Committee; and H. B. Fernald, chairman of the Executive Tax Committee. Mr. Young announced with particular pleasure the acceptance by Mr. Samuel H. Dolbear, Wright and Dolbear, New York,



Entertainment Features



(1) Lucky Shoe Entries; (2) Del Courtney, Orchestra Leader and Ward Wilson, Master of Ceremonies; (3) Jane Froman, Guest Artist at Banquet; (4) Joe E. Howard, Star, Gay Nineties; (5) Ruth Best, as "Jenny Lind"; (6) California Varsity Eight; and (7) The Byton Review

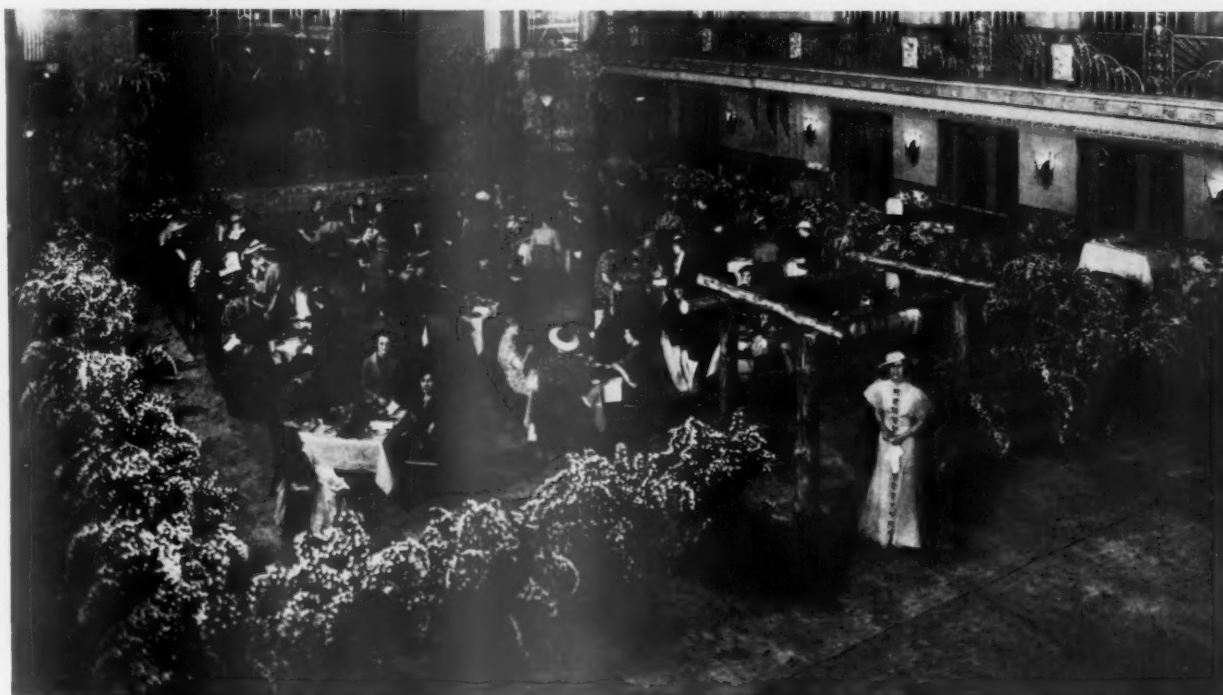
of the chairmanship of the newly created Committee on Cooperation with the Securities and Exchange Commission. Mr. Conover presented a comprehensive review of the various legislative and tax matters receiving attention from the American Mining Congress and also a statement on the work of the Operators' Committees. This was followed by a round-table discussion of problems currently facing the industry. Those attending included A. E. Bendelari, president, Eagle Picher Lead Company; Donald A. Callahan, president of the Callahan Mining Company; D. D. Moffat, vice president, Utah Copper Company; Erle V. Daveler, treasurer, Utah Copper Company; T. B. Davis, chairman of the board and J. D. Francis, president, Island Creek Coal Company; George B. Harrington, president of the Chicago, Wilmington and Franklin Coal Co.; E. J. Newbaker, vice president, Berwind White Coal Mng. Company; E. B. Greene, president, Cleveland Cliffs Iron Co.; F. G. Smith, assistant general superintendent, Sunday Creek Coal Co.; W. E. Barrow, president, Joy Manufacturing Co.; T. J. Thomas, president, Valier Coal Co.; D. R. Svem, manager coal operations, Northwestern Improvement Co.; Eugene McAuliffe, president, Union Pacific Coal Co.; Moroni Heiner, president, Utah Fuel Co.; R. W. Gillispie, president, Jeffrey Manufacturing Co.; Ralph Jamison, vice president, Jamison Coal Co.; J. J. Sellers, vice president, Virginia Iron, Coal and Coke Co.; John C. Cosgrove, president, West Virginia Coal and Coke Co.; Louis Ware, president, United Electric Coal Companies; C. E. Cowan, vice president, J. H. Weaver & Company; Grant Stauffer, president, Sinclair Coal Co.; L. Russell Kelce, vice president, Sinclair Coal Co.; Paul Weir, consulting engineer; Herbert Wilson Smith, Union Carbide and Carbon Corp.; J. Nobel Snider, Consolidation Coal Co.; J. F. Callbreath, secretary emeritus; A. W. Dickinson, Mining Congress staff.



Luncheon of the Board of Directors

A luncheon meeting was held on May

19, for members of the Operators Committees, whose work is under the direction of G. B. Southward, mining engineer for the American Mining Congress. The meeting was largely attended by committee members, and a report was presented on the progress during the year, and through a series of conferences held by the committees during the



Ladies' Luncheon and Bridge Party



Bruce G. Shotton

Chairman of the Manufacturers Division, under whose leadership the largest exposition in the history of the organization was presented.

convention week, plans were inaugurated for considerable activity of the committees in the coming months.

The exposition was by far the largest ever held by the Manufacturers Division; 151 companies participated. This represents an increase of 18 companies over the previous banner year. Spectacular exhibits were presented by the Jeffrey Mfg. Co., Sullivan Machinery Co., Goodman Mfg. Co., Joy Mfg. Co., Link-Belt Co., and United States Steel Corp. It was evident that considerable effort had been made by each and every exhibitor to present equipment in the most interesting and attractive manner. The growing number of specially prepared back-grounds was particularly noted. Certainly everything for the mine was in evidence. Considerably more than 100 absolutely new pieces of equipment were displayed for the attention of the operators. The aisles of the exposition were filled from the opening to the closing hour. Interest in what the manufacturer had to offer was evident at every point.

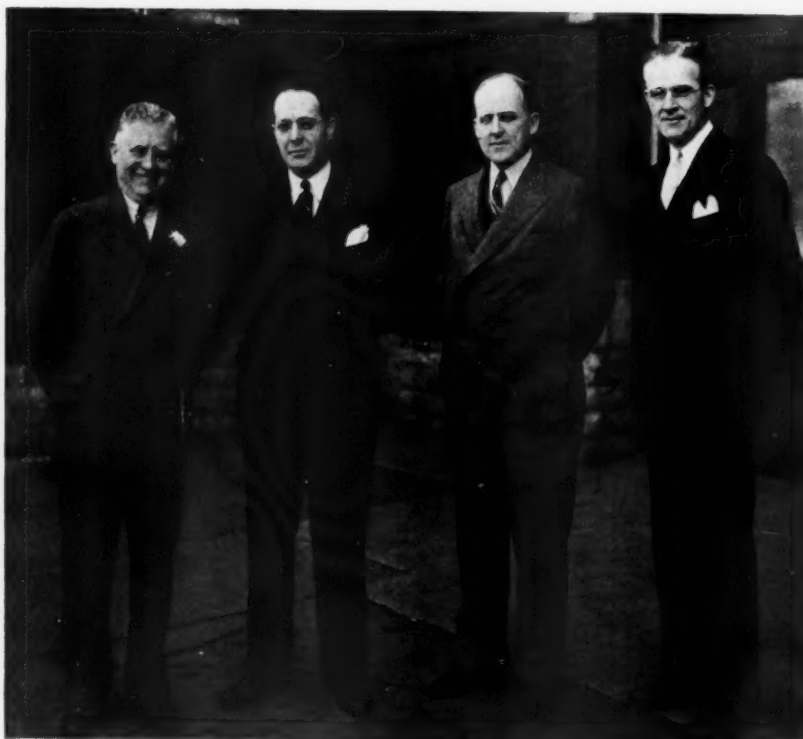
Each year a feature of the exposition is the award of the honor plaque, presented to the company voted as having the most outstanding exhibit. The method of selecting this exhibitor this year differed from previous years. A committee was appointed who judged the various exhibits on definite standards. The Sullivan Machinery Company, Chicago, and Claremont, N. H., received the honor plaque which was awarded at the annual dinner by George B. Harrington, toastmaster. Jos. F. Joy, head of the coal mining division of the Sullivan Company, accepted the plaque for his company and expressed his great appreciation of the honor conferred upon them. The second award of merit was given to the Link-Belt Company, Chicago, and third place was awarded the Jeffrey Mfg. Co., of Columbus, Ohio.

The annual prize contest was under the direction of A. W. Fisher of McGraw-Hill Publishing Company, and



William E. Goodman

Newly elected Chairman, Board of Governors, Manufacturers Division.



Some of the members of Board of Governors, Manufacturers Division. Left to right: John T. Ryan, Mine Safety Appliances Co.; Roy L. Cox, Jeffrey Manufacturing Co.; Arthur Knoizen, Joy Manufacturing Co.; and V. J. Nolan, National Carbon Co.



Music Hall, Cincinnati, Ohio

through the drawing of names at each evening's performance, a cash award was given to the lucky names chosen—M. M. Mounts, Knife River Coal Mining Co., Beulah, N. Dak.; David Roberts, Brilliant Mining Co., Birmingham, Ala.; J. D. Walsh, Jr., Union Coal Co., Peru, Ill.; and Thomas P. Greenhalgh, Hayden Coal Co., Haybro, Colo. Each received \$50 in cash when their names were drawn for the award.

The annual meeting of the Manufacturers Division of the American Mining Congress was held on May 18. This group sponsors the exposition which is such an important part of the convention. Bruce G. Shotton, Hendrick Mfg. Co., served as national chairman for the 1937 exposition. He is succeeded by Wm. E. Goodman, vice president, Goodman Mfg. Co., who will serve as national chairman for the 1937-1938 period. The following were elected officers of the Board of Governors of the Division: Wm.

E. Goodman, Goodman Mfg. Co., chairman; R. L. Cox, Jeffrey Mfg. Co., first vice chairman; Frank E. Mueller, Roberts and Schafer Co., second vice chairman; Arthur Knoizen, Joy Mfg. Co., third vice chairman. The Board of Governors for the Division is composed of the following representatives:

William E. Goodman, Goodman Mfg. Co., Chicago, Ill.; E. F. Carley, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; R. L. Cox, Jeffrey Mfg. Co., Columbus, Ohio; H. G. Marsh, Carnegie-Illinois Steel Corp., Pittsburgh, Pa.; P. H. Grunnagle, Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.; John T. Ryan, Mine Safety Appliances Co., Pittsburgh, Pa.; Arthur Knoizen, Joy Mfg. Co., Franklin, Pa.; G. E. Stringfellow, Edison Storage Battery Co., Orange, N. J.; C. B. Officer, Sullivan Machinery Co., Claremont, N. H.; L. W. Shugg, General Electric Co., Schenectady, N. Y.; J. C. Wilson, Ohio Brass Co., Mansfield, Ohio; Frank E. Mueller, Roberts & Schafer Co.,

Chicago, Ill.; Charles C. Whaley, Myers-Whaley Co., Knoxville, Tenn.; and V. J. Nolan, National Carbon Co.

L. W. Shugg, General Electric Company, served as director of exhibits, which is always a guarantee that an exposition will be expertly handled.

This year a very much larger number of wives of delegates attended the convention. Mrs. J. D. Conover served as official hostess and arranged some delightful entertainment features for the visiting ladies. These included an informal get-together lunch in the Continental dining room at the Netherland Plaza Hotel on Monday; an automobile trip to points of interest around Cincinnati, culminating in a beautiful tea in the Bridal Chapel of the Netherland Plaza Hotel; a luncheon and bridge party for which unique decorations were arranged and special entertainment provided; and trips to Rookwood Potteries and other interesting industries and points of interest.

Trade Agreement

Preliminary steps to negotiate a reciprocal trade agreement with Czechoslovakia have been announced by the State Department. It calls attention of interested persons to submit suggestions as to products that should be considered in working out the agreement.

The announcement is not a notice of intention to negotiate a treaty, the State Department emphasizes. It is a notice in keeping with a policy adopted some months ago whereby interested persons may have advance notice of what the department intends to do. Within a few weeks a notice of intention to negotiate

will be issued, at which time there will be made public a list of products on which the United States may make reductions to Czechoslovakia. This is in line with representations made by the American Mining Congress.

Suggestions for products to be considered in the agreement may concern either imports or exports. Exact technical description of the products must be given in making recommendations to the Committee for Reciprocity Information. Last available statistics for 1935 disclose relatively small imports from Czechoslovakia of building stone, magnesite, copper and manufactures of the metal, potassium compounds, iron and steel manufactures, mineral salts.

Czechoslovakia is a large importer of copper, heavy machinery, sulphur, borax, sodium nitrate, in addition to foodstuffs.

Fellowships Offered

The School of Mines, University of Alabama, and the Southern Experiment Station of the U. S. Bureau of Mines, offers two fellowships in mining and metallurgical research. The fellowships are open to graduates of universities and engineering schools. The value of each is \$500 per year and the 1937-38 schedule includes Washability Studies of Coal, Beneficiation Studies of Non-metallics. J. R. Cudworth is director of the School of Mines.

The Federal Securities Act

(Continued from page 19)

within a reasonable time after the date of issuance of such securities. If the property has no such value, so state."

In the discussions already mentioned it was clearly demonstrated to the representatives of S. E. C. that mining claims are not dealt with on the marketplace like corn or hogs, sugar or wheat, and that there is hardly a standard of value for even a developed and producing mine with years of profit statements.

As a result of those discussions one concession was granted—and the Commission did insert in the form published or released December 23, 1936, an additional clause to the effect that if the property had such value, but the amount was impracticable of determination, you could so state—but in such case you must also state "the reasonable upper and lower limits of such value."

Exhibit K is linked with the requirements called for by Exhibit J. This covers an opinion by counsel as to the legality of the securities—the issue of stock—and especially, if issued for property, as is the case 99 times out of every 100, then whether such stock has been fully paid—with proper citations of constitutional and statutory provisions, and pertinent or applicable court decisions—coupled with a further opinion as to whether, if the promoter sold property to the company for stock of a par value greater than the actual cost of such property to the promoter. Such promoter is liable to the company for the difference. There are other matters mentioned which are to be covered or considered by legal counsel in the giving of such opinion. This is neither the time nor the place to enter upon any extended discussion of the intricacies of the questions so involved, nor of the difficulties facing any lawyer retained to write and sign an opinion such as is required to be set forth in Exhibit J, and its bearing on Exhibit K. Suffice it to express my own personal view thereon, to the effect that I would wonder at—but hardly imitate—the temerity of counsel in Colorado who would now give a categorical answer to such questions in the situations usually and customarily existent governing the issue of stock for mining properties. Especially in view of the pertinent Colorado decisions. Anyone interested may read them. They are:

Homestead Mining Co. vs. Reynolds, 30 Colo. 330.

Buck vs. Jones, 18 Colo. App. 250.

Speer vs. Bordelean, 20 Colo. App. 413.

Kunkle vs. Soule, 68 Colo. 524.

Soule vs. Kunkle, 71 Colo. 221.

Stratton's Independence vs. Dines, 135 Fed. 449.

Barnard vs. Sweet, 74 Colo. 302.

Illustrative of the divergence of judi-

cial opinion, and the difficulty confronting counsel on these matters. Note this: The Homestead Mining Company case was a transaction whereby the entire capital stock was issued to the owners of the mining property conveyed to the company—as full-paid. Court said:

"Under our statute a transaction of this kind is sanctioned, and such consideration is considered a valuable consideration."

In the Buck Case:

"In the case of corporations organized under the laws of this state for the development of mining property, the capitalization may be and usually is, fixed with reference to prospective value."

Kunkle Case:

"Many corporations for the exploitation of * * * mining claims * * * issue their certificates of stock for property without market value. Very valuable property often has no market value."

But, in the last Colorado case cited above, our Supreme Court held that the foregoing cases did not contain "the whole rule"—and that the property "must be reasonably worth the par value of the stock which is issued for it"—that the directors must "reasonably believe it to be of such value in money" and "have reasonable ground for the belief."

Is the lawyer required to search the conscience of the board of directors of the mining company—to find the reasonable grounds for their belief that a group of undeveloped mining claims which cost about \$20,000 to gather together was reasonably worth the \$100,000 par value of stock—even though only one-tenth of the total capital stock—which the company issued for such properties? Or can the "prospective value" still be used as the "standard of value"—the "legal basis" as mentioned and required by S. E. C. to be set forth in Exhibits J and K?

Let some other lawyer answer that question. Presumably he will refuse to do so, unless he is paid a fee somewhat commensurate with the risk and responsibility involved—which might add considerably to the cost of preparing the registration statement.

Hence—and I am here expressing my own personal views only—I am inclined to the belief that, except for companies developing an enterprise of considerable magnitude, and fortified with adequate funds, the prospect for some time to come—for the smaller mining ventures—is none too rosy.

That may be the situation—as stated—for some time to come. Frankly, many of those connected with the administration of the S. E. C. whom I have met, have impressed me with the conviction that they are genuinely interested in, and in a mood sympathetically helpful toward, the western mining men and his problems in the enlistment of capital funds for worthwhile development programs; that they recognize the speculative element naturally surrounding the mining venture, and recognize also the

fact that, to a large extent, the vast mining regions in Colorado, Nevada, California, Idaho and throughout the west have been rendered productive through the smaller investors' willingness to take a share in the risk. They are inclined to be helpful. But until there are enlisted in the top positions of the Securities Commission, among those who direct and control its policies through its administrative rulings, regulations and forms some men who are mining-minded, who are experienced and informed as to our problems, physical, financial and engineering, men who can see eye to eye with and talk the language of the miners and the mine operators—until then, I can only state the situation as being best expressed by the slogan, "All Quiet On the Western Promotional Front."

Mercury Industry in 1936

The output of mercury in the United States in 1936 amounted to 16,569 flasks, according to the United States Bureau of Mines, compared with 17,518 flasks in 1935. Production declined, despite increased demand and higher prices for the material. The lower rate of production, however, was not uniform, for among the important producing areas, Arkansas and Oregon accounted for larger quantities than in 1935. Imports of metal into the United States in 1936 were considerably more than twice the amount received in the preceding year, and this increase accounted for the much larger supply of mercury for 1936. The international mercury situation continued to be dominated by the civil war in Spain, where the largest mercury reserves of the world are located, and by the large demands for metal in the principal mercury consuming nations of the world, partly for armament preparations and partly because of fears concerning future supplies. The termination of war between Italy and Ethiopia and the removal of sanctions against Italy eased the situation somewhat.

An event of utmost importance in the international situation was the sudden breaking up of the cartel agreement between Spain and Italy. Barring the possibility of destruction of the Almaden mine workings and reduction equipment in Spain, the dissolution of the mercury cartel would seem to forecast a renewal of the competitive conditions that prevailed prior to the formation of this organization.

In the United States the maritime strike and bad weather conditions in the final quarter of 1936 contributed to lack of supplies of domestic metal at the end of the year in New York. The larger amount of mercury used for placer gold mining in western states reduced the amount of metal available for shipment. The average monthly quoted price for mercury in New York was \$73.92 a flask in August, \$85.28 in September, and \$90.25 in November and December.

Mechanization Trends

Chairmen of the Coal Operators Committees Meet at Cincinnati

DURING the week of the Cincinnati Convention, the National Project Committees held a number of conferences to discuss their respective work and to formulate plans for continuing their studies.

On Wednesday, May 19, a luncheon meeting was held by the District and Project Committee chairmen, where the work of the committees was reviewed and plans for the future adopted. This meeting was attended by the following:

C. C. Ballard, New River Company; I. N. Bayless, Union Pacific Coal Company; L. C. Campbell, Koppers Coal Company; W. W. Dartnell; W. C. Fancourt, Berwind White Coal Mining Company; Wm. Goodman, Goodman Manufacturing Company; H. L. Griffin, Koppers Coal Company; M. W. Horgan, Monongahela West Penn Public Service Company; H. B. Husband, C. & O. Railway Company; P. D. McMurrer, American Mining Congress; R. G. Pfahler, Berwind White Coal Mining Company; J. J. Sellers, Virginia Iron, Coal & Coke Company; F. G. Smith, Sunday Creek Coal Company; G. B. Southward, American Mining Congress; D. D. Wilcox, Superior Coal Company.

Mr. Wm. Goodman, chairman, Manufacturers Division, expressed the interest of this group in the committee work and assured the chairmen of their cooperation in furnishing information for project reports.

Leading the discussion, G. B. Southward, mining engineer for the American Mining Congress, introduced P. D. McMurrer, recently appointed Assistant Mining Engineer, and submitted his annual report, commenting as follows:

"The work of the Coal Operators Committees has definitely progressed from gathering statistics to making detailed reports. The National Project groups must lead the way by deciding what information is required for their particular study and then arrange to secure this information through the cooperation of the District Committees.

"The cooperation that has been given to this work and the approval which the reports have received indicate that this organization of committees has established a definite place for itself in the industry and has filled a long-felt want in providing a contact between men in different fields and between operators and equipment manufacturers."

During a discussion of District Committee activities, H. B. Husband, chairman of Central West Virginia, explained that his group held monthly meetings at various operations where common problems and new ideas were discussed. Due to the success of this plan, another such group is to be organized in Southern West Virginia soon.

Mr. R. G. Pfahler, Chairman of the Central Pennsylvania District Committee, Mr. W. W. Dartnell, Chairman of the Northern West Virginia District Committee, and Mr. J. J. Sellers, representing the District Committee of Virginia, presented their views on the idea of having regular periodic meetings of their respective groups. Mr. I. N. Bayless, representing the Rocky Mountain District, stated that due to the distances involved, this plan was impracticable in his section and that the work of their group must necessarily be done by correspondence.

The various Project Committees reported as follows:

Conveyor Mining. Mr. W. C. Fancourt, representing Mr. T. F. McCarthy, Chairman of the National Project Committee on Conveyor Mining reported that in collecting a number of reports on conveyor operations, it became evident that there was a definite need for a standard time study form. The committee has prepared and adopted a form which is now available to the industry through the courtesy of both the Goodman and Jeffrey Manufacturing Companies. Performance data will be gathered from a number of companies which are using conveyors.

Mining Systems. Mr. F. G. Smith, Chairman of the National Project Committee on Mining Systems, advised that following a study of the reports on mining systems already submitted, this committee has prepared a small data sheet which will be submitted to the district chairmen in order to obtain the information necessary to the completion of their study.

Power. Mr. M. W. Horgan, Chairman of the National Project Committee on D. C. Distribution Lines Underground, reported that this project report had been completed and submitted to the industry.

Mr. Carl Lee, Chairman, and Mr. C. C. Ballard, Vice Chairman, of the National Project Committee on Sub-Stations, reviewed the discussions of this group which was held earlier in the week.

They are now beginning a study of Sub-Stations which in addition to construction methods, types of converting equipment, protective devices, etc., will also include the determination of the point where additional transmission lines should be used or where the sub-station should be moved ahead.

Surface Preparation. Mr. H. L. Griffin, Vice Chairman of the National Project Committee on Surface Preparation, explained the work of this committee. The project report on "Methods of De-Watering Washed Coal" is now being completed and this group are starting a study of "Screening" which will include types of equipment, sizing, and screen efficiencies.

Mechanical Loading. In the absence of Mr. H. A. Treadwell, Chairman of the National Project Committee on Mechanical Loading, the immediate work of this group was discussed briefly. This committee will continue to gather reports on mechanical loading operations and to prepare a standardized form of time study for presenting performance results.

Machine Cutting. Mr. D. D. Wilcox, Chairman of the National Project Committee on Machine Cutting, reviewed the reports that have already been submitted, and presented the committee's recommendation for continuing the studies. A number of reports have been compiled on cutting conditions, performances, and bit treatment. The committee is now beginning a study of effect of bit lacing, type of bits, and cutting speed on machine performances, and the sizes of the coal cuttings.

Mine Haulage Roads. Mr. L. C. Campbell, Chairman of the Sub-Committee on Rail and Track Accessories, and Mr. A. R. Joyce, Chairman of the Sub-Committee on Ties, discussed the organization of this committee and the progress made to date. This committee will continue its study of construction methods and materials for main line haulage roads, which includes ties, tie spacing, alignment, and track accessories.

Safety. In the absence of Mr. C. W. Connor, Chairman, the work of the National Project Committee on Safety was reviewed briefly. A number of reports have been submitted from various fields showing the types of safety programs and safety educational activities in use. These will be continued in order to determine the proven fundamentals of successful safety campaigns.

Wheels of Government

(Continued from page 22)

proceeded toward the promulgation of the code required by the Act. The other members of the commission are: C. E. Smith, Percy Tetlow and Walter H. Maloney, who were on the old commission; and the new appointees are: Thomas S. Haymond, John C. Lewis and Pleas S. Greenlee. The Senate also confirmed as consumer's counsel for the commission, Mr. John Carson, former secretary to the late Senator Couzens, of Michigan.

Cutting Requirements For Conveyor Mining

(Continued from page 25)

Under such circumstances, it is normally expected that repairs, when necessary, are to be made at the face. Frequent inspection by the employe responsible for making repairs should be arranged, as many times minor repairs made at the proper time will prevent serious breakdowns. Often with machines left at the face, the tendency is to neglect inspections.

One operator has devised a plan that has much merit. It is to select a mechanic on each conveyor shift whose duty it is to make all minor repairs, and the machine is operated so that these repairs will not interfere with his usual duties. This mechanic need not be any particular employe. For instance, on one shift he may be one of the four machine men, while on another he may be the shift boss, and for another section of the mine the mechanic's regular duties may be at the loading head.

A complete set of tools for the mining machines are included as a part of the conveyor equipment, and, of course, conveyor tools are also included. The tools and small number of supplies are kept at the loading head where they are accessible for all units of equipment. The transportation of supplies for major repairs at the face is some times an important problem, but, where the machines are a long distance from the mine track, it is often advisable to move the supplies rather than the machine.

In conclusion, a brief review of the cutting requirements for conveyor mining is given as follows:

First, the machine operation is made to suit the system or method of conveyor used at a particular mine. The conveyor system is selected after considering the factors of safety, methods of roof control, local conditions, and the production desired.

Second, the power necessary for the mining machine depends upon the character of the coal seam and other local conditions, including bits used and the relation of the cutter chain speed to the rate of travel of the cutter bar across the face. Mini-

mum power use can be assured by maintaining adequate voltage at all times.

Third, cooperation is vitally necessary between employes of the various shifts, and some degree of periodic inspection of machines is necessary in order to assure minimum maintenance costs and continuity of production.

Lowering Cost by "Rubber Tired" Mining

(Continued from page 26)

and securing 250 to 300 tons per shift. The additional equipment placed in the mine consisted of two caterpillar trucks for the shortwall cutting machines, three tractors, three 5-ton capacity trailers, a transfer station, and an automatic battery charging station. The system was placed in service March 17 and after having operated but 12 shifts with the tractor-trailers, with all loading from narrow work, Andrew Moffat produced 413 tons at the rate of 27 tons per man for coal on cars ready to move to the tippie. The ease with which this tonnage was secured in narrow work warrants belief that 500 tons per shift will be secured from the 7 B. U. Joy loader. It was also found that the tonnage from shortwall cutting machines was stepped up about 30 percent by being able to move over the shortest route from place to place.

An attractive feature is that the difference between production cost on hand loading and this system of mechanical loading, based on the installations now in service and others estimated, will apparently return the investment on the total cost in changing from hand to mechanical loading in approximately 200 single shifts and proportionately shorter time on double shift operation.

Consumption of Ferrous Scrap and Pig Iron in the United States—1936

Domestic consumption of iron and scrap steel amounted to 36,469,000 gross tons in 1936, an increase of 38 percent over 1935, according to preliminary figures compiled by the Bureau of Mines. Total consumption of pig iron amounted to 29,778,000 tons, or 44 percent above the previous year. The use of pig iron as a raw material in the manufacture of steel increased 46 percent in 1936, whereas the quantity of scrap charged directly to steel furnaces increased only 38 percent. Likewise, the increase in the use of home scrap in steel making was more pronounced than that of purchased scrap. The net effect of the relatively greater use of pig iron and home scrap in 1936 was to reduce slightly the proportion of purchased scrap in ferrous materials charged to steel furnaces from 26.4 percent of the total in 1935 to 24.6 percent in 1936. Production of steel

ingots increased 40 percent in 1936. Exports of scrap continued at a high rate, but were 8 percent below the record shipments of 1935. Prices of iron and steel scrap were materially higher in 1936, reflecting the larger domestic demand as well as the heavy export trade. Preliminary figures given herein for consumption of ferrous materials in 1936 are based on reports from concerns accounting for over 95 percent of the total consumption. Consequently, in view of the large coverage, final figures to be released at a later date should not show any substantial revisions.

Vermiculite—A New Commercial Mineral

Vermiculite, a drab-looking mineral that opens up like an accordion or swells like a moistened sponge when heated, was virtually unknown commercially a few years ago; but in 1936, according to reports of producers to the Bureau of Mines, sales exceeded 17,000 tons, worth \$185,000 at the mines. By the time the processed and bagged material reached the ultimate consumer, its value was enhanced to around \$75 a ton, consequently the industry's sales actually exceeded \$1,000,000 for the year. Production was speeded up in anticipation of trebling the sales in 1937.

The principal use of this interesting material is for insulating dwellings, to retain the heat in winter and keep it out in summer. In the form of loose fill for this purpose, it competes with mineral wool. After expansion, the commercial product is lighter than cork, weighing as little as 6 lb. per cubic foot. The great bulkiness of the expanded product is the secret of its utility for insulating against heat and sound, but it also is a handicap to cheap transportation.

Two companies operating on opposite ends of a large deposit near Libby, Mont., have so far furnished the bulk of the output, but there are two or three producers in Colorado, two in North Carolina, and at least one in Wyoming. Deposits have been found in other states, but occurrences of high-grade vermiculite are far less common than was generally supposed, even a year or two ago.

Research Associates

Four appointments as research associates will be available at Battelle Memorial Institute, Columbus, Ohio, for the year 1937-38. The appointments are open to graduates of any accredited university or college. Preference will be given to men who have completed one or more years of graduate study in chemistry, physics, metallurgy, fuel technology, or ceramics. The purpose of the research division is to extend the work of the Institute in fundamental science and at the same time to develop highly trained research men for industry.

News and Views

of Interest to Mining Men

Gold and Silver Output Continues to Increase

Figures compiled by the American Bureau of Metal Statistics show that the output of both gold and silver continue to rise. The indication is that the output of gold in 1937 will reach the highest figure in history, while that for silver will reach the highest total in recent years. Output of 2,887,000 ozs. of gold in the first 3 months of this year shows an increase of 2.2 percent for the same period of 1932.

Tin Substitutes

Frank L. Hess, an authority on strategic metals, recently told the House Appropriations Committee that cans could be made of aluminum and folded instead of soldered. He reported extensive progress in the developments of tin substitutes to reduce this country's dependence on imports. Dr. Hess said that about three-quarters of the present tin imports could be stopped if these substitutes are successful and if barium could be used as an alloy with lead in bearing metals and if aluminum-plated steel could replace tin-plated steel.

World Copper Stocks Drop

World stock of refined copper declined 25,070 tons during April, which is the largest drop since August, 1936. Domestic stocks were decreased 21,870 tons and foreign refined reserves went down 3,200 tons. Consistent demand from consumers abroad lowered stocks in the hands of producers. Total world production of copper during April from 240,150 tons to 215,740 tons. Domestic output increased to 94,900 tons from 90,850 tons. April was the largest month for export of copper from the United States, when 9,166 tons were shipped to foreign countries.

WPA Report

We may expect higher prices for minerals in about 10 years, according to a report issued by the WPA in cooperation with the U. S. Bureau of Mines, which presents the technological outlook for the mineral industry. The report indicates there is little likelihood of any immediate absolute exhaustion of any mineral. Changes in technology point toward further concentration of mineral production in a small number of larger and more efficient plants. Exceptions to this trend which were more spectacular than important were found in the bootlegging of anthracite, the little truck mines of the bituminous coal fields and portable sand and crushed stone plants.

According to the report, technology is working to increase competition between one branch of mining and another. More and more one metal substitutes for another, while competition between the various sources of fuel become more fluid and more interchangeable. F. G. Tryon, Chief Coal Economist of the Bureau, said: "If discovery of new deposits should cease today, proven reserves in the United States would meet the requirements of this country for a period ranging from perhaps for 10 years for petroleum to probably more than 2,000 years for coal." Of the major metals, such as iron, copper, lead and zinc, gold and silver and aluminum, the report said: "In some degree the technologic development in progress will lead to a reduction in operating cost and so in prices, but in the main they will be attempts to combat rising costs due to the necessity of utilizing lower grade, more complex and deeper lying ores, and to increased labor costs, which will result in a tendency to substitute mechanical power for human labor. The outlook for recovery of demand is perhaps more favorable in the case of the metal group than it is in coal." In dealing with manganese, tin, mercury, tungsten, graphite, mica, asbestos, nickel, etc., the report said: "With the background of more than 20 years' study of the manganese problem, the only possibility that seems left for much change is the development of a process that will utilize the kind of material that we can produce. The same can be said for chromium. Prospects of any substantial production of tin from domestic deposits are poor. There is hope of finding additional deposits of tungsten, but the use of this metal is threatened by substitute materials and present mining is a function of tariff protection, as is the case with quicksilver. No change seems indicated in our dependence from foreign sources for cobalt, platinum, osmium, iridium, ruthenium, and palladium." The administration anticipates making additional reports which will deal principally with various extractive industries, including bituminous and anthracite coal, petroleum, natural gas, iron, copper, lead, zinc, silver and gold and non-metallics.

Contracts Awarded

The Island Creek Coal Company has awarded three contracts for the installation of Interstate automatic aerial tramway systems for the disposal of mine refuse at their Mines Nos. 7, 14, and 20, Holden, W. Va., operations. The installations at all three mines will be similar,

the main units being interchangeable. At Mine No. 7 the tramway will convey the refuse to a hollow 1,300 ft. distant from the tippie and provide for over 21 years' dump at an average output of 70 tons per hour.

At Mine No. 14 the refuse will be taken to a dump 2,500 ft. from the tippie at an average output of 60 tons per hour. The dump area available will provide storage for over 70 years' output.

At Mine No. 20 the tramway will have a capacity of 100 tons per hour at an average haul of 1,750 ft. and provide storage for approximately 30 years' dump.

In all three installations the refuse will be automatically fed from the present refuse bins to the tramway cars by an ingenious arrangement of reciprocating plate feeders and charging skip-hoists.

The three installations will be designed and installed by the Interstate Equipment Corporation of New York and are scheduled to be in operation about September 1, 1937.

Rectifier Supplies D-C Current For Coal Company

A new mercury arc rectifier for mine service has been installed to supply direct current to the trolley system in one of the mines of the Pittsburgh Coal Company. It is rated 600-kw., 575-volt d.c., 2,300-volt, 3-phase, 60-cycle. The equipment consists of an outdoor power transformer to supply low voltage of the proper potential to the rectifier, heat exchanger, fan and pump to circulate water through the rectifier and maintain it at proper temperature, and automatic switching equipment.

Large Ore Body Found

Tamarack & Custer Mining Company struck a large body of good ore early in May on the new low level in that well-known property in the Coeur d'Alenes. This company resumed operations about the first of the year, after a long period of idleness.

A winze was sunk from the Canyon Creek tunnel level 300 ft., a cross-cut run and the ore discovered about where the engineers expected to find it. First reports are that the ore body is 7 ft. wide, of which 5½ ft. is high-grade mill feed, lead and silver in Burke quartzite. This is the first of the so-called "Day" properties to resume operations. Jerome J. Day is president.

Fifty Years Ago

John C. Cosgrove, former president of the West Virginia Coal and Coke Corporation, recently sent to the National Coal Association an interesting item from the *Daily Tribune*, Johnstown, Pa., May 4, 1887, which stated as follows: "The Rolling Mill Mine was permanently closed on Saturday, the use of natural gas in the various departments of the Cambria Iron Company's works

rendering its further operation unnecessary. In 1860 James Morley, who came here in 1855 from Brady's Bend and was appointed superintendent of the mines, put a force of men to work preparing the Rolling Mill Mine for operation and in the fall of that year the first car of coal passed down the little railway to the mill. William Warden, who had charge of the blacksmith shop, was at work in the shop when the first car of coal passed down the track and he was also there at work when the last car passed down." Mr. Cosgrove's comment is, "There is nothing new under the sun."

Length of Trains

A bill has passed the United States Senate making it unlawful for any common carrier to operate a train over its line of road carrying more than 70 freight or other cars exclusive of the caboose. The railroads estimate that the legislation would impose an additional expense of between \$150,000,000 and \$237,000,000 annually. The main purpose of the bill was designed to increase safety and give greater employment.

Bituminous Coal Production

For the week ending May 15, bituminous coal production was approximately 7,125,000 net tons. Production for the calendar year to May 15 was 174,571,000 tons. For the same period in 1936 production was 154,673,000 tons.

Predicts Market Crash in 1939

Chas. G. Dawes, chairman of the board of the City National Bank and Trust Company of Chicago, former Vice President of the United States, has just issued a new book, "How Long Prosperity." The principal conclusions reached by Mr. Dawes are (1) that a high degree of prosperity will maintain in this country into 1939; (2) that beginning in the summer or fall of 1939 there will be a stock market collapse; (3) that there will then ensue in the United States a minor recession in business of one or two years; (4) that this recession will be followed by a period of prosperity.

Coal Maps Ready

The Coal Information Bureau, Inc., Pittsburgh, Pa., has just completed and is offering for immediate delivery a series of 14 coal maps showing the location of each mine, name of operator, name of mine, by districts and regions, of all coal mines served by the Baltimore and Ohio Railroad. These maps are said to be original, accurate, complete, and up-to-date. In connection with each map, information is available showing the following information: name and address of operator, name of mine, shipping point, railroad, county, seam of coal, description of preparation equipment, sizes made, daily tonnages, name and address of sales agents.

Eagle Picher Increasing Output

The Eagle Picher Mining and Smelting Company, subsidiary of the Eagle

Supreme Court Upholds Validity of Social Security Act

The Federal Government won a sweeping victory when the Supreme Court upheld the validity of the unemployment insurance and old-age benefits provisions of the Federal Social Security Act. The court also upheld the validity of the Alabama state unemployment insurance law.

The decision on the unemployment insurance provisions of the Federal Act was five to four. Justices Hughes, Brandeis, Stone, Cardozo, and Roberts concurred in the majority opinion. Three dissenting opinions were read—one by Justice Butler, one by Justice Sutherland, concurred in by Justice Van Devanter, and one by Justice McReynolds.

The ruling on the Federal old-age benefits provisions was seven to two. The majority opinion, written by Justice Cardozo, was concurred in by Chief Justice Hughes, Justices Van Devanter, Brandeis, Stone, Sutherland, and Roberts. Justices McReynolds and Butler dissented on the grounds that these provisions of the act "are repugnant to the Tenth Amendment."

Four cases in which the social security program was attacked from three different angles were before the tribunal for decision. They were:

1. Action originated by the Charles C. Steward Machine Co., Birmingham, Ala., contesting the unemployment payroll tax. The Fifth Circuit Court of Appeals upheld the tax. Supreme Court sustained the ruling in a five-to-four decision, as noted above.
2. A suit brought by George P. Davis, stockholder in the Edison Illuminating Co., Boston, challenging the validity of the Federal tax imposed to finance old-age pensions. A Federal district court upheld the law but it was condemned by the First Circuit Court of Appeals; the Supreme Court in its seven-to-two decision ruled it valid.
3. An attack on the Alabama unemployment insurance law by the Gulf States Paper Corporation. A Federal court held the law invalid. Supreme Court reversed the ruling in a five-to-four decision, with Justices McReynolds, Sutherland, Butler, and Van Devanter dissenting. The Alabama Act was also challenged by the Southern Coal and Coke Corporation, and the ruling in this case was identical with the Gulf States decision.

The court held that the taxes were excise taxes and that there was a clear right under the law for their levy.

Picher Lead Company, has announced that it will increase the capacity of the central mill in Oklahoma to 10,000 tons of lead and zinc ore per day; 6,000 tons per day is the present capacity.

New Tipple and Washery

The United Electric Coal Companies of Illinois have started work on the construction of a coal tipple and washing plant which will cost approximately \$500,000. The plant is expected to be in operation in early October. It has a capacity of 7,000 tons a day and will be able to crush to past 12 ins. and the 3 by 0 will be washed. The plus 3 will be hand picked in 12 by 6 and 6 by 3 sizes. All coal of plus 48 mesh will be cleaned and recovered. The United Electric Coal Companies are exclusively strip mine operators.

Experimental Tunnel

A research tunnel for testing purposes has been established by the U. S. Bureau of Mines on the government reservation at Mt. Weather, Va., under a co-operation agreement with the Weather Bureau and the Department of Agriculture. The object of the project is to increase the knowledge of the details of the various steps in metal mining and to improve the underground working conditions affecting the health of miners.

This work is similar to that being done by the bureau at its experimental coal mine at Brucetown, Pa. The problems on the current program at Mt. Weather will include technical investigations of rock drilling, tests to establish the comparative efficiency of rock drill bits fabricated from different steel alloys and from carbon steel. Studies of the formation and prevention of dust caused by blasting, rock drilling, loading of mine cars and underground transportation, research in blasting, including the depth and method of placing drill holes, ventilation, and other related subjects. Wing G. Agnew is resident engineer.

Iron Ore Season Started

Inter-lake navigation for the 1937 season was opened on April 15. According to *Skills Review*, the movement of iron ore from Lake Superior district during April should amount to about 2,750,000 tons. It is estimated that the May shipments this year may amount to some 10,000,000 tons.

Safety Meet

The annual West Virginia Mine Safety Meet and First Aid Contest will be held in Mt. Hope, October 2. Representatives of 7 mining institutes in the state will participate. Each of the institutes will send 3 teams.

New Tipple

The Elmer Miller Coal Company, sales agent of Appalachian Coals, Inc., for the products of The Beaver Coal and Mining Company, announces completion of a new tipple at the mine of the latter company at Drift (Floyd County), Ky. Operations at the mine were to have been resumed as of June 1. A. B. Miller, secretary of the company stated that they have installed the most modern vibrator screens, vapor oil-treating equipment, crushers and electro-magnets.

Addition to Kellogg Plant

The Sullivan Mining Company, subsidiary of Hecla Mining Company and Bunker Hill and Sullivan Mining and Concentrating Company, has authorized an additional unit for the present electrolytic zinc plant at Kellogg, Idaho, which will increase the present capacity by 50 percent. Work will start at once with an expenditure of over \$1,000,000.

Federal Purchases Early Bird

The Federal Mining and Smelting Company on May 1 purchased the underground leases of the Early Bird and Big Elk Mines in the Tri-State Lead and Zinc District. The transaction includes the lease on 170 acres of the estate of J. M. Cooper, and the Big Elk Mill. These properties were formerly owned by the Semple Mining Company.

Fuel Conference

The 19th Fuel Engineers' Meeting, affiliated with Appalachian Coals, Inc., met at Cincinnati on May 19. Those in attendance included executives, fuel engineers, sales managers, coal chemists, and representatives of the producing and selling companies of the industry. Members of the Bituminous Coal Research, Inc., appeared on the program for the meeting. These included John C. Cosgrove, president of Bituminous Coal Research; Howard N. Eavenson, president of the Clover Splint Coal Company; and a large number of representatives from the government, state colleges, manufacturers, etc. R. E. Howe, vice president and treasurer of Appalachian Coals, Inc., welcomed the delegates, and stated that this meeting was the largest on research ever held by an engineering group in the United States.

To Open New Level

Magma Copper Company has now driven its new Shaft No. 8 to the 2,900-ft. level and sinking will continue to the 4,000-ft. level. It is anticipated that this depth will be reached by the end of the year. The new air conditioning equipment recently ordered will be installed on the 3,400 and 3,600-ft. levels. The average working temperature on the lower levels is about 85 degrees and it is planned to lower this temperature by 10 degrees. The management anticipates the complete installation of this equipment within the next few months.

New Contracts Placed

The Inland Steel Company is placing contracts for the necessary equipment to

Metal Mining Meeting



Guy N. Bjorge

Chairman, Program Committee
General Manager, Homestake Mining
Company



D. D. Moffatt

Director, the American Mining Congress
Vice President, Utah Copper Company

supply houses. There will be an interesting and instructive program; a splendid exposition of mining machinery and supplies; entertainment that is typical of western enthusiasm and hospitality. Full information will be presented through the pages of the Journal. All those interested in metal mining will plan now to be present and take advantage of this opportunity which is presented but once annually.

Plans are rapidly developing for the Annual Metal Mining Convention and Exposition of the American Mining Congress, to be held at Salt Lake City, Utah, September 6 to 10, 1937. Hundreds of suggestions have been received for consideration of the Program Committee which will hold its first meeting at Salt Lake City, June 16. The Exposition will be greater than ever before with more than half of all the space available now assigned to important machinery and



Oscar N. Friendly

Chairman, Western Division
General Manager, Park Utah Mining
Company, Utah

build 5 additional open hearth furnaces at its Indiana Harbor, Ind., properties. It is anticipated that work on these will begin at once.

National Coal Meeting

The Board of Directors of the National Coal Association met on call of President J. P. Williams at the Biltmore Hotel, in New York City, on May 26.

Utah Copper Increases Production

According to D. C. Jackling, the Utah Copper Mines at Bingham Canyon is operating at a higher rate than in 1929, and at the highest rate in its history. During the year the company has added some 250 ore cars and additional power shovels and locomotives. The company employs some 3,500 men.

Smoke Prevention Convention

The 31st Annual Convention of the Smoke Prevention Association was held at the Pennsylvania Hotel, New York City, June 1-4.

Rocky Mountain Coal Mining Institute

The 35th regular meeting of the Rocky Mountain Coal Mining Institute was held early in June at the Cosmopolitan Hotel, Denver, Colo. Papers presented were devoted quite largely to operating problems, including mechanization and safety. Glenn A. Knox, of the Gunn Quealy Coal Company, president of the association, opened the meeting with an address of welcome. An exhibit was held in conjunction with the meeting.

Wholesale Coal Association

The American Wholesale Coal Association held its annual meeting at French Lick, Ind., May 15-18. Among the speakers were C. F. Hosford, Jr., chairman of the National Bituminous Coal Commission; John D. Battle, executive secretary of the National Coal Association; and A. D. Carlton, president of the association.

The Tax Policy League, Inc.

The Tax Policy League, Inc., New York City, has recently issued a publication, "How Shall Business Be Taxed?" which presents a symposium conducted by the league last December. Among the contributors are Ellsworth C. Alvord, tax attorney, well known in mining fields.

Code Fixing Bituminous Prices

The National Bituminous Coal Commission has stated that the impossibility of establishing minimum and maximum prices on bituminous coal under the Bituminous Coal Control Act of 1937, must be delayed until August 1. One of the commission's first acts was to request President Roosevelt to defer the 1-cent a ton sales tax which the act provides shall be effective June 1. The Fair Trade Practices Code, set up in the Guffey Act, has been submitted to the industry and it is hoped that producers will accept the code within the next 15 days. Several members of the commission are under the apprehension that

Wage and Hour Legislation

President Roosevelt on May 24 sent a message to Congress calling for the enactment of minimum wage and maximum hour legislation at this session of Congress.

Basing his message upon the Federal Government's power to regulate interstate commerce through the commerce clause, he asked Congress to pass a law providing:

1. A maximum work week.
2. A minimum wage.
3. A ban on child labor.
4. Non-admittance to interstate commerce of goods produced under other than conditions meeting the standards of "free labor."

He said: "Allowing for a few exceptional trades and permitting longer hours on the payment of time and a half overtime, it should not be difficult to define a general maximum working week. Allowing for appropriate qualifications and general classifications by administrative action, it should also be possible to put some floor below which the wage ought not to fall. There should be no difficulty in ruling out the products of the labor of children from any fair market. And there should also be little dispute when it comes to ruling out of the interstate markets products of employers who deny to their workers the right of self organization and collective bargaining, whether through fear of labor spies, the bait of company unions, or the use of strikebreakers. The abuses disclosed by the investigations of the Senate must be promptly curbed."

Directly after the reading of the message, Senator Black, chairman of the Senate Committee on Education and Labor, and Representative Connery, chairman of the House Committee on Labor, introduced identical bills in their respective houses calling for enactment of the President's program. These bills call for:

1. A board of five to administer labor standards.
2. Provisions for maximum hours and minimum wages are left blank in the bills as introduced. These are to be filled following committee hearings.
3. Child labor products in interstate commerce are banned.
4. Goods moving into interstate commerce must have been produced under conditions which allow collective bargaining and which are free from employer coercion.

September 1 will be the date to anticipate publication of prices. It is understood that in the meantime the following provision of the act will be in force: "From the date of approval of this act until prices shall be established * * * no contract for the sale of coal shall be made providing for delivery for a period longer than 30 days from the date of contract."

Federal Mining Votes Reduction

Stockholders of the Federal Mining and Smelting Company recently approved a reduction of the third preferred capital by \$1,144,200. The company hopes by the end of the year to retire \$500,000 additional preferred, bringing the total outstanding shares to 12,032. F. H. Brownell, president of the company, stated that if it were not for the undistributed profits tax it would be the policy of the company to use all earnings for retiring preferred stock. He said that approximately 40 percent of the estimated \$2,500,000 earnings for 1937 will be used for retiring preferred stock.

Wage Scale Agreement

A new wage scale contract applying to a large percentage of the 13,000 coal miners employed in the United States Steel Corporation's coal subsidiaries was signed May 18. The agreement was the result of negotiations with Thomas

Moses, president of the H. C. Frick Coke Company, and P. T. Fagan, of the United Mine Workers of America. The new contracts were made only for members of the miners' union.

Phelps Dodge Files Expansion Program

The Phelps Dodge Corporation has filed a registration statement with the SEC covering \$20,285,000 convertible debentures, due in 1952, and an undetermined number of shares of \$25 capital stock to be reserved for conversion of the debentures. The company states that additional funds for carrying out its program for capital expenditures over the next 5 years will come from treasury funds resulting from operations over the period and if necessary from further financing. They plan to allot the proceeds as follows: Copper Queen Branch, \$2,507,000 for equipment; New Cornelia Branch, \$4,171,500 for equipment; United Verde Branch, \$959,000 for equipment. They will spend \$28,760,000 for the opening and equipping of the Play Ore body at Morenci, and \$3,573,000 for miscellaneous buildings and additional machinery for the fabricating division. For miscellaneous purposes, \$885,000 will be spent.

New Carnegie-Illinois Plant

W. A. Irvin was the guest of honor at the ground breaking for the new Car-

negie-Illinois plant, to be known as the New Irvin Works of the Carnegie-Illinois Steel Corporation. The Irvin Works, according to the building layout, will be almost a mile long and about $\frac{1}{4}$ of a mile wide; 52 acres will be required to house the mills alone. More than 100 additional acres will be needed for warehouse space, shipping yards, and other facilities.

Inventor of Transitorq Receives Longstreth Medal

At the annual medal meeting of Franklin Institute, of Philadelphia, on May 19, and before a group of distinguished scientists from many countries, Richard T. Erban was presented with the Longstreth medal for outstanding contribution to science by the invention of the Transitorq. This invention, after five years of development work by New Departure, division of General Motors Corporation, is now marketed as the New Departure Variable Speed Transitorq—an infinitely adjustable speed transmission. It is notable that this was the only award this year to a strictly commercial product—and is probably the only transmission ever to be so honored. The outstanding features of Transitorq design attracting the attention of the judges of Franklin Institute were: Infinite change of speed, the positive and efficient transmission of power without gears, belts or pulleys, and the exact control of speed, either automatically or manually—direct or remote—by temperature, light beam, time periods, or other mediums.

Interior Department Appropriation

The House recently passed the \$115,000,000 Interior Department appropriation bill for the coming fiscal year. No record vote was taken and no important changes were made. The bill now goes to the Senate Appropriations Committee, where it is expected slashes from the total will be made before the measure is brought to the Senate floor.

The bill carries Bureau of Mines and Geological Survey appropriations. The former was voted \$2,119,240 and the latter \$2,787,000.

The Illinois Mining Institute

The summer meeting of the Illinois Mining Institute will be held on the Steamer Golden Eagle, Friday, June 11, to Sunday, June 13. Among the papers to be presented are: "Selling of Accident Prevention to the Management," by H. G. Westerland, Chicago, Wilmington and Franklin Coal Company; "Electric Arc and Oxy-Acetylene Welding," by Carl Lee, Peabody Coal Co.; "Recent Developments in Bituminous Coal Cleaning," by W. C. McCullough, United Electric Coal Companies; "Coal Selection from the Consumers' Viewpoint," by K. C. Richmond, editor, *Coal Heat*; W. J. Jenkins is president of the Association and B. E. Schonthal is secretary and treasurer.



Charles F. Hosford, Jr.

Coal Commission Organizes

Members of the National Bituminous Coal Commission and the Consumers' Council took their oath of office May 17 in the Conference Room of the new Department of Interior Building. After the ceremony the commissioners went into session on administrative matters with Undersecretary of the Interior Charles West. Charles F. Hosford, Jr., was elected chairman of the commission. The first work of the commission will be the promulgation of the Bituminous Coal Code, which will be sent to all the districts with forms to be signed by the producers. Each district will have a deputy secretary to conduct the elections of the district boards. They will also have a statistical bureau. These latter bureaus will probably have the same personnel as the statistical bureaus that were established in many of the districts under the previous act. The work of the bureaus will be to find the cost of producing coal in 1936, thereby ascertaining the average cost for each of the different minimum price areas. The newly appointed advisory council includes Phillip Murray, as representative of the United Mine Workers. Those representing the industry are E. R. Stettinius, of the U. S. Steel Corporation, and Gerard Swope, General Electric Company.

Members of the Coal Commission are C. F. Hosford, Jr., Pennsylvania, and Thomas H. Haymond, general manager, Elkhorn Coal Co., representing the producers; Percy Tetlow, Ohio, and John C. Lewis, president, Iowa State Federation of Labor, representing the miners; C. E. Smith, West Virginia; Walter H. Maloney, Missouri; and Please E. Greenlee, Shelbyville, Ind., former secretary to ex-Governor McNutt, representing the public; John Carson, former secretary to the late Senator Couzens, of Michigan, and recently secretary of the new Maritime Commission, consumers' counsel; and F. W. McCullough, Charleston, W. Va., former WPA administrator for that state.

The National Bituminous Coal Commission announced on May 24 that it had determined to publish the Bituminous

Coal Code, although the code will not be formally promulgated until June 21, 1937, at which time the President will be requested to issue an executive order making the code and the tax provisions of the act effective on that date. The act was formally signed April 26, and members of the commission officially qualified May 17.

The law provides that the tax section shall become effective on June 1, 1937, unless the Coal Commission has not formally promulgated the code and form of acceptance before that date, in which event the code and tax provisions become effective when the code is formally promulgated and the President issues an executive order making both code and taxes effective.

Because of the time required for printing of the necessary forms and distribution to all coal producers throughout the United States, the commission has decided to defer the formal promulgation of the code until June 21, 1937, in order to afford all coal producers ample opportunity to accept the code and, by their acceptance, to secure exemption of the tax of $19\frac{1}{2}$ percent imposed by the act upon noncode members.

The commission also announced that it will probably issue an order appointing acting district secretaries to call and direct organization meetings of code members in the 23 districts provided for in the act. The order will require the holding of such meetings and the election of district board members not earlier than June 21, 1937, and not later than June 25, 1937, and follows closely the procedure adopted by the former commission in administering the act of 1935.

The Bituminous Coal Code now being published sets forth the various provisions of section 4 of the act, which are intended to regulate interstate commerce in bituminous coal and to be applicable to matters and transactions in or directly affecting such interstate commerce.

Manganese

Secretary of the Interior Ickes recently told the House Appropriations Subcommittee that experiments in the production of manganese from domestic ores were giving promising results and indicated the further development of the U. S. manganese industry. He stated that the Bureau of Mines is developing technological methods for utilizing lower grade ores.

Copper Companies Declare Larger Dividends

Kennecott Copper Corporation, Calumet and Hecla Cons. Copper Company, and United Verde Extension Mining Company each announced special dividends as a result of increased earnings in the base metal industries. Kennecott ordered a special cash distribution of 25c and another cash distribution of 50c. Calumet and Hecla announced a dividend of 50c and United Verde Extension voted \$1 disbursement.

Tennessee Coal Iron & RR Company Signs Agreement

On May 10 the Tennessee Coal, Iron and RR. Co., a subsidiary of U. S. Steel Corporation, signed an agreement with the United Mine Workers of America, granting their workers an increase of 50c per day in the basic wage scale. J. L. Perry, president of the company, said that they employ about 5,000 miners and that they signed the contract with the U. M. W. of A. as representatives of certain of its employees. The agreement will run until April 1, 1939.

Zinc Institute Members Inspect Strip Mill

One hundred members of the American Zinc Institute and the Galvanizers Committee of the institute, made a 2-hour inspection trip through the mill of the Granite City Steel Company, which was personally conducted by Hayward Niedringhaus, president of the steel company. Of particular interest was the new hot and cold strip mill recently completed as a part of a \$5,000,000 improvement plan.

A New Alloy

A net profit of \$11,714,956.82, equivalent to 77 cents per share on the common stock after allowing for preferred dividend, is reported for the first quarter of 1937 in the quarterly statement of The International Nickel Company of Canada, Limited. In the accompanying letter to shareholders, Robert C. Stanley, chairman and president, emphasizes the work of his company's development and research department in originating new alloys containing nickel. He writes:

"Since its inception your company's research and development organization has directed its efforts not only to finding new uses for nickel but equally to originating new alloys containing nickel. During recent years several such alloys have been perfected and are now established in industrial and engineering uses. One of these new alloys is 'K', which offers, in addition to high non-corrodibility, the great strength and other physical properties associated with alloy steel. Thus, as a result of your company's research program, the engineering properties of a non-ferrous alloy have been raised to those of special steels. 'K' is non-magnetic and, like steel, can be hardened or softened by heat treatment. It can be readily forged, machined, and welded. 'K' and other recently-developed non-ferrous alloys definitely broaden the opportunity for nickel to be of service in an industrial era which demands better engineering materials to meet exacting conditions."

Magnesium Industry in 1936

Production (sales) of primary magnesium in 1936 totaled 3,903,312 lbs., a decrease of 8 percent compared with 1935, according to the United States Bureau of Mines. The Dow Chemical Company at Midland, Mich., continued as



Charles H. Segerstrom

GOLDEN RIVET FOR GOLDEN GATE BRIDGE

Charles H. Segerstrom, President, Carson Hills Gold Mining Company, recently presented the San Francisco Golden Gate Bridge with a Golden Rivet. Mr. Segerstrom was asked by the Golden Gate Bridge Company and Highway District Committee to donate a rivet of California gold to mark the completion of the bridge. The rivet, shown above, against a background of the bridge itself, weighs 18 ounces and has been polished to a glistening lustre. A bronze plaque has been placed next to the gold rivet to mark its location. The rivet was driven by Ed Stanley, riveter, before Joseph Strauss, engineer, who designed the bridge, and several hundred distinguished citizens. The riveting ceremony was broadcast around the world. The bridge was opened officially for traffic on May 28.

+ + +

the sole producer of the metal, which is derived by electrolysis of magnesium chloride obtained from brine.

The 8 percent decline in magnesium output in 1936 was probably due to loss of foreign markets, recently an important factor in total sales, rather than decreased consumption at home. Lack of data on the volume of exports of this metal prevents an accurate appraisal of domestic consumption but increased activity in the various industries using magnesium suggests a substantial rise in the use of this metal in 1936. Consumption of magnesium as a deoxidizer in the metallurgical industry and as a component in aluminum and other alloys probably continued at a high rate. Outstanding in 1936, however, was the increase made in its application as a material of construction in the form of high magnesium alloys.

New Volume Upon Chemistry

A. Cressy Morrison, recently presented to the American Chemical Industries tercentenary committee "Man in a Chemical World." The preparation and publication of this volume was authorized as a result of the great success of the celebration of the 300th anniversary of the founding of the Chemical Industry in the United States in 1635 by John Winthrop. The book is designed to place before the public in simple language the unsurpassed contribution of the chemical industry not only to the well-being of the individual, but its unparalleled place as a contributor to human comfort, protection, the advancement of civilization and the upbuilding of the United States of America. The book is distributed without cost.

—Personals—

Edward R. Clarke, Jr., has been appointed assistant mining engineer for the Anaconda Copper Mining Company.

R. J. Wysor was recently elected president of the Republic Steel Corporation at a meeting of the board of directors which followed the annual meeting of stockholders. Mr. Wysor has been associated with the corporation since its formation.

Chas. A. Owen, president, Imperial Coal Corporation, is recuperating from a serious illness at Miami, Fla.

T. M. Girdler was elected chairman of the American Iron and Steel Institute. He is chairman of the Republic Steel Corporation. E. T. Weir, chairman of the National Steel Corporation was elected vice president of the Institute.

Ralph E. Taggart, at the annual meeting of stockholders of the Philadelphia and Reading Coal and Iron Company, of which company he is president, stated that lower rail tariffs were necessary to the successful advancement of the anthracite industry.

A. Y. Peterson, of Duluth, vice president and general manager of the Oliver Iron Mining Company, recently was in New York on a business trip.

W. W. Dartnell, formerly with the Valley Camp Coal Company, has recently joined the staff of the Sullivan Machinery Company at Claremont, N. H.

E. P. Humphrey has been elected vice president of the General Coal Company; Stonega Coke and Coal Company; Virginia Coal, Iron and Railroad Co.; Westmoreland Coal Company; and Westmoreland, Inc.

H. N. Roache, consulting engineer at Dover, N. J., recently presented in *Iron Age* a splendid article dealing with iron ores in New Jersey. The author presents an estimate of the non-titaniferous iron ore reserves in New Jersey and discussed their metallurgical value and their future market.

C. H. Chaplin and H. C. Moore have recently been appointed members of the marketing division staff, Appalachian Coals, Inc.

G. H. Shyrook was recently elected vice president and director of Madeira, Hill and Company.

D. O. Hubbard, special representative of The Eagle-Picher Sales Company, on Monday, May 10, addressed a regular luncheon meeting of the Knoxville Technical Society, at the Hotel Andrew Johnson, Knoxville, on the subject of "Mining



D. O. Hubbard

and Manufacturing of Lead Paints." His talk had been postponed from January 25, when he was unable to reach Knoxville because of the Ohio River flood. Mr. Hubbard's intimate acquaintance with the lead industry and his years of association with it, supplemented by a motion picture of white lead making, made his talk exceptionally interesting, and an informal discussion followed. The society's membership includes Tennessee Valley Authority engineers, hydro-electric plant engineers, City of Knoxville engineers, college professors, and other technical men stationed in the vicinity. Approximately 100 members attended the meeting.

E. A. Loring, wife and daughter passed through Virginia City, Nev., on their way to London from Australia, where Mr. Loring's firm is heavily interested in mining. Mr. Loring is a son of W. J. Loring, president and managing director of Arizona Comstock, and succeeded his father as a partner in Bewick, Moreing & Company, of London, England.

Edwin L. Derby, Jr., geologist for the Cleveland Cliffs Iron Company, has been spending some time in the East.

S. Power Warren is president and general manager of the newly organized Bryan Mining Company, which will operate properties of the Simon Silver-Lead Mines, Inc., in Nevada.

C. F. Hosford, Jr., chairman of the National Bituminous Coal Commission, was a speaker at the annual meeting of the American Wholesale Coal Association at French Lick, Ind.

B. M. Concklin, Arthur Iron Mining Company, was recently at Phoenix, Ariz.

E. W. Englemann, Utah Copper Company, was recently elected chairman of the Utah Section of the American Institute of Mining and Metallurgical Engineers.

R. E. Howe, Appalachian Coals, Inc., was a main speaker at the recent research conference held at Cincinnati.

Max Barber, Cleveland Cliffs Iron Company, was recently in San Antonio, Tex., on business.

Scott Turner has been elected vice president and member of the Board of the International Mining Corporation.

Harry L. Flory was recently elected president of the Ohio Coal Conference, which recently held its Sixth Annual Convention at Columbus, Ohio.

Charles H. Segerstrom, president of the Nevada-Massachusetts Company, was a speaker at the San Francisco section of the A. I. M. M. E.

Edward E. Loomis has resigned as president of the Lehigh Valley Railroad Company, a position he has occupied for the past 20 years. He was elected chairman of the board and of the executive and finance committees. Duncan J. Kerr was elected president.

J. A. MacKillican, manager of the Meriden Iron Company of Minnesota, has recently been on vacation in Honolulu.

Russell B. Caples, general superintendent, Anaconda Copper Mining Company, was a recent New York visitor.

J. F. Graves has been appointed vice president of the Bethlehem - Fairmont Coal Company.

C. F. Hardy, fuel engineer, Appalachian Coals, Inc., was a speaker at the first annual convention of the Virginia Coal Merchants' Association.

F. E. Wormser, secretary of Lead Industries Association, has returned to New York after an extended western trip.

Charles H. Behre, Jr., professor of economic geology at Northwestern University, has received a Guggenheim Fellowship for the purpose of studying certain lead-zinc ore deposits.

Harry A. Smith has been elected president of the Delaware, Lackawanna and Western Coal Company. Elliot Farley resigned as president, effective May 1. Gordon C. Cooke was elected vice president and secretary.

George E. Gemmell has been appointed mill superintendent for the American Smelting and Refining Company.

W. Val Decamp has changed his headquarters to Oruro, Bolivia, where he will have supervision of both the Huanchaca Mine and the properties of Cia. Minera de Oruro.

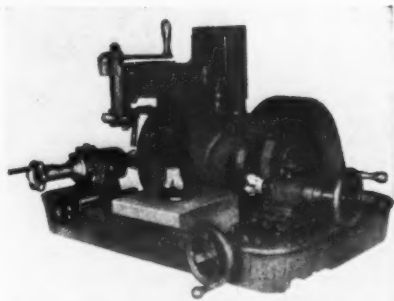
With the Manufacturer

Sullivan Announces New Bit

Sullivan Machinery Company announces the new Sullivan detachable bit grinding attachments for use on the various type of detachable bit grinders now on the market.

The Sullivan detachable bit with the unusual design of broad chopping or reaming edges and single cutting edge necessitates a different grinding method from that used on the conventional detachable bit.

The new attachment consists of a holder for loading, a barrel with an expansion collet for gripping the bit, and a rocking sleeve mounted on an adjustable base.



Alignment is secured by the cutting edges of bit resting between two bars of the loading fixture and bit holder inserted in the loading casing. The alignment is automatic as the expansion collet tightens to grip the bit the holder slips into alignment stops. The holder is then inserted into the rocking sleeve with rocker rolls contacting the radial cams while a dowel pin fits into groove on the sleeve to insure true grinding. A rocking of the holder grinds the reaming edge and one side of the cutting edge. The rocker rolls contact the radial cams during the entire grinding operation, so that the bit is in proper contact with the grinding wheel to produce a straight cutting edge. The holder is then revolved 180 degrees, and the same simple operation is repeated and the bit is ground.

The gauge is ground by the same method as utilized on the various type of machines.

Safety Increases

The du Pont Company announces that, based on reports from its various plants and office buildings, the safety record of the company in major injuries for the year 1936 is the lowest in its history. The number of employees in 1936 was 53,000, an increase of about 15 percent since the end of 1935. The total number

of tabulatable major injuries, the company states, was 170. What is called the frequency rate was 1.9 major injuries per 1,000,000 hours of work. The fatality rate per 1,000,000 hours worked was 0.067. The severity rate was 0.83 days lost because of major injuries per 1,000 hours. These percentages establish all-time low records in the company's history.

New Bulletin

Allis-Chalmers Mfg. Company, Milwaukee, Wis., has put out a new illustrated Bulletin 1833 covering its recently announced Utah electro-magnetic feeders and conveyors which can be used to handle any dry or moist material that can ordinarily be handled, delivering it at a thoroughly uniform rate to crushers, screens, grinding mills, belt conveyors, concentrating and other processing equipment. The bulletin tells if its low power requirements of inclination effects on the feed rate, of positive control for varying the feed rate, and gives table of sizes and capacities, and other pertinent information.

Condensed Catalog of Vertical Compressors

A compact presentation of the Worthington line of vertical, single-cylinder, single-stage air-cooled and water-cooled compressors is offered in an illustrated 8-page bulletin. Ask for Bulletin L-621-B5. Address Worthington Pump and Machinery Corporation, Harrison, N. J.

New Jeffrey 29-U Universal Cutter

Shown for the first time at the Cincinnati Show was the new Jeffrey 29-U universal type, track-mounted cutter which features adjustments and feeds hydraulically operated and controlled. This machine will under-cut, center-cut, top-cut, and shear anywhere in the seam within its wide range of adjustments.



Linde Completes New Oxygen Plant

The Linde Air Products Company, unit of Union Carbide and Carbon Corporation, announces the opening of a new Linde oxygen plant on Powhattan Avenue, Essington, Pa., near Philadelphia. This plant will take care of the increasing oxygen requirements in the Philadelphia area. This brings the total number of Linde oxygen plants serving the oxy-acetylene welding and cutting needs of industry throughout the United States to 70. The oxygen requirements within the city limits of Philadelphia will be served, as formerly, by the Linde plant at 18th and Cambria Streets, Philadelphia, and the additional facilities will take care of the growing needs of the surrounding area.

New Elevator Bucket Developed By Link-Belt

A notable improvement in the design and construction of Salem steel elevator buckets is announced by Link-Belt Company, probably the first radical change in 60 years. The new so-called Super Salem steel elevator bucket is reinforced at the digging lip, front corners, and along back. Additional strength and greater resistance to abrasive wear and distortion are claimed for this construction, without increase in bucket weight.

A new 4-page illustrated folder, No. 1435, giving full information, with list prices, will be sent to any reader upon request, which may be addressed to Link-Belt Company, 2410 West 18th Street, Chicago, or to the nearest office of the company.

Mahan Appointed at Westinghouse

S. D. Mahan has been appointed general advertising manager of the Westinghouse Electric & Manufacturing Company, according to an announcement by G. H. Bucher, executive vice president.

Formerly manager of merchandising advertising, Mr. Mahan, in his new position, will have general supervision over all advertising and sales promotion work of Westinghouse and its subsidiary companies. His headquarters will be in Mansfield, Ohio, where the merchandising division of the company is located.

New Bulletin

Mine Safety Appliances Company has issued a new bulletin which gives equipment suggestions for first-aid contests. They point out that the widespread activity and interest in first-aid contests

has built up an extraordinary demand for equipment available. The bulletin presents a list of all of the things this company believes necessary to make a real success of a contest.

New Electromode Industrial Heater

A new Electromode Industrial Heater (Model IBN) has been announced by the Electric Air Heater Co., division of the American Foundry Equipment Co., 555 South Byrkit Street, Mishawaka, Ind. Many completely new features are used in the design of this heater, such as the single, cast, circular grid; a cast aluminum fan housing; and a stronger housing construction.

Consolidation of Sales Departments

P. R. Mork, vice president in charge of sales, Crane Co., Chicago, announces the coordination of all activities concerned with the estimating, engineering, or sales of valves, fittings, pipe, and fabricated piping into one unit, the *valve and fitting department*, with Mr. W. H. Pape as manager.

Appoints Canadian Representative

Traylor Engineering and Manufacturing Company, G. B. Livingood, advertising manager, announces that the Canadian Fairbanks, Morse Co., Ltd., maintaining 12 offices throughout Canada, has been appointed selling agent for Traylor equipment in all of the Dominion of Canada except the Province of British Columbia and Newfoundland. This company has also issued a new bulletin No. 3012 which covers its reduction crushers. Copies are available on addressing Allentown, Pa.

New Alloy Resists Acids

A new alloy known as "Hastelloy B" is now being offered for use under extremely severe conditions of corrosion.

The new alloy has been developed by two units of Union Carbide and Carbon Corporation working in collaboration—Haynes Stellite Company and Union Carbide and Carbon Research Laboratories, Inc. Hastelloy B is a further addition to the series of Hastelloy alloys which were originally developed eight years ago, and, like the others, is being marketed by Haynes Stellite Company, Kokomo, Ind.

This new alloy has been produced primarily for service in equipment handling hydrochloric acid in all concentrations and at temperatures up to and including the boiling point. It also stands up well in sulphuric and phosphoric acids, acetic and other organic acids, and in nonoxidizing acid chloride solutions. In 20 percent hydrochloric acid at the boiling point the rate of penetration of the solution is only 0.0016 in. per month.

The new alloy is composed of nickel, molybdenum, and iron.

New Plug-In Instruments Need No Panel

New, low-cost, detachable instruments for general industrial use whose sockets may be cut into the conduit run feeding a motor or grouped in standard metal boxes to constitute a panel assembly are announced by Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Sockets can be installed at low cost in all circuits feeding electrical loads in industrial plants and processes where it would be helpful to know consumption and performance characteristics, even if only occasionally. Direct advantages of the plug-in instrument for industrial use include: (1) Socket provides its own switchboard, eliminating costly panels, wiring, and mounting details; (2) various instruments can be plugged in the same socket to obtain volts, amperes, watts, power factor, kilowatt hours, etc.; and (3) sockets can be installed and sealed off, providing convenient outlets

for future installation of instruments or making connections for portable analyzers for periodic testing.

A detachable instrument consists of two main units: First, a socket or mounting device which is provided with electrical connection jaws, and second, the instrument mechanism mounted on a plate having electrical connection blades on the back and enclosed in a weatherproof housing of glass. The instrument unit is arranged to be plugged into the socket, automatically completing all electrical connections between the jaws in the socket and the blades on the instrument. The two units are then sealed together with a tamperproof sealing ring, forming a weatherproof unit, which may be used either indoors or outdoors as desired.

Engineer Appointed

The Sullivan Machinery Company announces that John C. Curtis, formerly chief engineer of the Cleveland Rock Drill Company, has joined the engineering staff of the rock drill division. Mr. Curtis assumes the duties of chief engineer, succeeding Arthur R. Hosking, who is now assistant manager of the division.

"Ruptor" Equipped Air Motor-Starter

The Allis-Chalmers Manufacturing Company announces a new type of across-the-line air motor-starter, equipped with "Ruptors," known as type AP-7. The "Ruptors" are enclosing chambers which confine and depotentialize the arc formed by circuit interruption. These "arc-depotentializing chambers" greatly increase the interrupting ability of the contacts, and form an isolating barrier between contacts of opposite polarity. The starter is furnished for 7½ hp. at 440 and 550 volts, 5 hp. at 220 volts, and 3 hp. at 110 volts.

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Coal Cleaner and Deduster
EIGHTY-TWO
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Highly specialized knowledge of coal handling, cleaning and preparation, plus correct engineering design and construction, is available within the R and S organization, together with our recommendations on processes, methods and equipments.

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INDEX TO ADVERTISERS

	Page
American Cable Division.....	Third Cover
DuPont de Nemours Co., E. I.....	6-7
Goodman Mfg. Co.....	11
Hercules Powder Co.....	3
Hoffman Bros. Drilling Co.....	58
Joy Mfg. Co.....	12
Koppers Co.	13
American Hammered Piston Ring Division	
Bartlett Hayward Division	
Engineering & Construction Division	
Tar & Chemical Division	
Western Gas Division	
Koppers-Rheolaveur Co.	
The Maryland Drydock Co.	
The White Tar Co. of New Jersey, Inc.	
The Wood Preserving Corp.	
Link-Belt Co.	8
Loftus, Peter F.....	58
Mine Safety Appliances Co.....	5
National Carbon Co., Inc.....	10
Ohio Brass Co.....	9
Pennsylvania Drilling Co.....	58
Pierce Management	58
Roberts & Schaefer Co.....	57
Robinson Ventilating Co.....	58
Sullivan Machinery Co.....	Back Cover
Union Carbide & Carbon Corp.....	10
Universal Vibrating Screen Co.....	58

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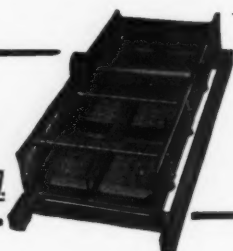
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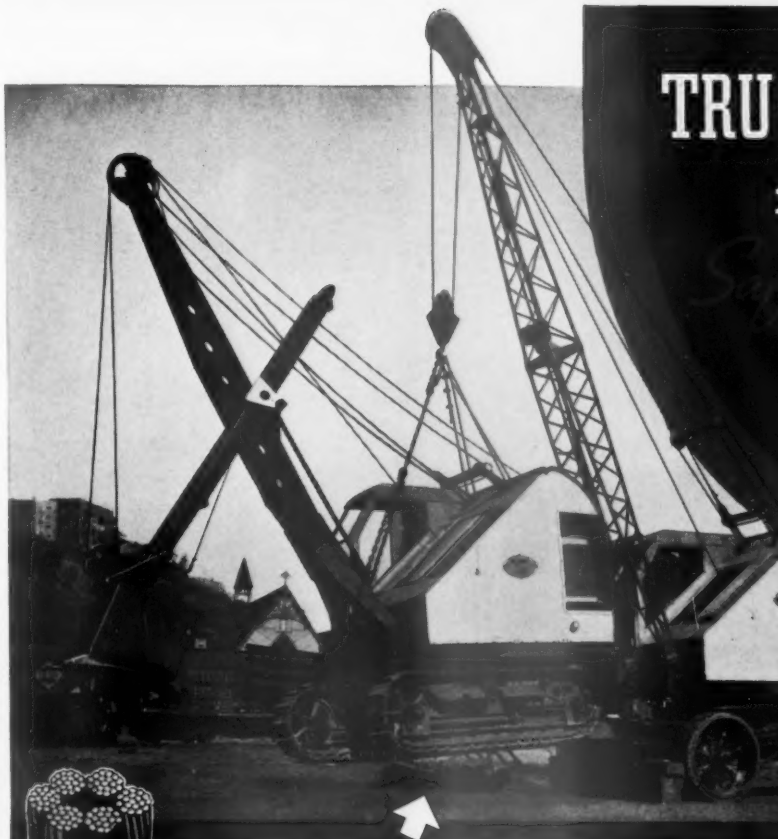
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Not only the lifting power of a crane or the working endurance of a shovel, but the safety of both machines and men are largely dependent upon the strength, dependability and safety of the TRU-LAY Preformed ropes with which they are operated.

Literally thousands of operators have proved for themselves the long life, uniform dependability and safety of TRU-LAY Preformed Emerald Strand. Write for descriptive literature today and learn for yourself what others have known for thirteen years—that TRU-LAY Preformed gives both a greater safety factor and greater dollar value.

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MAY 21, 1937

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EXPERTS CLAIM SULLIVAN COAL CUTTERS 10 YEARS AHEAD OF TIMES

Largest Attendance in History of Convention Acclaim Sullivan Leadership in the Manufacture of Modern Coal Cutters

Leading authorities on modern mine machinery organization claim that Sullivan coal cutters are the most modern and efficient ever designed. The Sullivan coal cutters are the most modern and efficient ever designed. The Sullivan coal cutters are the most modern and efficient ever designed.

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10B SULLIVAN "BIG BUDDY"
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6B SULLIVAN "MASTER"
CLE 5 SULLIVAN LONGWALL



SULLIVAN

Sullivan answers the demand for a track-cutting advance. It embodies many of the features that made the 7-AU the World's Fastest track cutter. Sullivan's new line of coal cutters is the result of the endless stream of improvements that have been made in the Sullivan coal cutters. Sullivan's "Master" cutters are the most modern and efficient ever designed. They are the result of the latest advances in coal cutting technology. Sullivan's cutters are the most modern and efficient ever designed. They are the result of the latest advances in coal cutting technology.

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